An archaeological analysis of industrialisation within the rural context of post-Medieval south west Scotland

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Abstract

This thesis details the archaeological remains of the period 1600-1870 by focusing on the landscapes of transformation within the county of Ayrshire, south west Scotland. It presents an alternative view to the understanding of the industrial and agricultural past by employing a theoretical structure which bonds together Industrial Archaeology and Medieval or Later Rural Settlement studies in a bid to develop a more integrated appreciation of the history of the recent past. The theoretical model of vernacular and political landscapes, combined with landscape studies and archaeological assessment are presented as key mechanisms for interpretation of this period. Analysis is concentrated across a wide variety of remains from post-improvement settlement studies to the archaeology of domestic and mass production industries. This holistic approach is proposed as central to a clearer comprehension of the complexities of landscape history and historical archaeology.

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Introduction

> "The Industrial Revolution may be compared with the Reformation as an event that stopped and turned the current of social life into new and unfamiliar channels" (Smout 1987, 230)

In many senses the quote above and the reality of archaeological research into the period of wholesale transformation in the historic landscape are poles apart. Quite clearly the major transitions in society, economy and culture known as the Agricultural and Industrial Revolutions have tended to be treated as something of Cinderella subject within archaeology. Unlike the case in History or Historical Geography the study of the age of transformation - for want of a better term - has been seen as an unfashionable topic for archaeological research since the beginnings of the discipline; a feature which is still apparent in the 1990s. This thesis has been envisaged as an attempt to alter that perception and present the archaeology of the recent past as a vibrant and important topic worthy of detailed analysis. To do this effectively in an academic environment that has so far lacked a consistent critique of theory and methodology, focus has been required on a scale which utilises work from across a broad-church of other disciplines where *historical* interest has been part and parcel of the development of understanding of the period in question. The archaeological interests within this period have tended to be pigeon holed into select areas of interest, which it is argued have not help in the general understanding of landscape change and its impact on people. This is particularly true of England where interest has been focused in short archaeological timespans, the classic example being

archaeological studies in the early modern period. This of course is partially due to the development of period societies such as *The Society for Post-Medieval Archaeology* who have until recently retained a firm grip on the boundaries, tending not to stray into other time zones. Although things are clearly changing in this respect with a shift in emphasis occurring across all period societies in the 1990s, with transition between periods now viewed as the way ahead rather than a distinct break in cultural terms. In Scotland, the development of archaeological interest has tended to be more encompassing in nature with divisions not as strictly retained, though a certain degree of specialisation is still apparent. Medieval or Later Rural Settlement studies (MOLRS) and Industrial Archaeology in Scotland have remained separate with few writers crossing over to view the impact of both Revolutions upon each other (cf. Turner 1982; Shaw 1984). This has led to effectively separate disciplines dealing with separate subjects, when in reality change itself showed a higher degree of integration in the past. Interestingly that division of interest in Scotland has not been made on strictly chronological grounds, but more on thematic grounds; a consistent feature of studies in the industrial past which is discussed more fully in chapter 3. Clearly the development of MOLRS studies in Scotland has not been as chronologically restricted as the English discipline, a feature which in the recent words of one English commentator "throws into question our obsession - in England, at least - with often meaningless period definitions" (Barker 1997, 4-5). Although this thesis has been given dates at which it begins and ends (i.e. 1600-1870), these should be read as purely nominal. Understanding the past it is argued is not about creating false boundaries in time, it has more to do with a cognitive recognition that cultural history is a continuum of life. It is essential that understanding extends beyond subjective

boundaries and deals with periods of change or transition as a product of what went before.

Although this work is effectively about the impact and role of industrialisation on settlements, and by extension, on the human population in the period 1600-1870, the fundamental requisite of that change is to understand transition in agrarian and industrial communities on an equal par. It is postulated that only then can the full force of the Improvements and Industrial Revolutions be fully interpreted. In the following chapters it will become apparent that economic and social change, particularly after 1750, led to a fundamental transition in community life: for many people this meant migration from the agricultural zone and 'vernacular' lifestyles to a *new* industrialised and urbanised form of living. It is postulated that the impact on communities cannot be assessed by focusing on a particularist view of the past, in order to access the complexity of transition and alteration. The archaeological evidence must be based on more holistic grounds. In the most basic of terms there is a need to understand the whole experience of change, rather than simply re-canting the developments in industrial development without any recourse to changes in the agricultural sphere. Tom Devine has recently hinted at this position in his analysis of the Statistical Accounts data:

> "The data confirm the widespread nature of industrial penetration of the lowland countryside which must have intensified demand for agricultural produce at the local level" (Devine 1994, 45).

This piece of work recognises that fact, but goes beyond it to appreciate that the relationship was not simply one-way. Industrial expansion clearly did draw on agriculture, but it also allowed higher yields to occur by developing processes that enabled industrialisation to occur in farming regimes as well as cotton mills or ironworks. The importance of this relationship should not be overlooked, particularly in a period which saw huge demographic expansion and urbanisation; it was an essential pre-requisite of social change that the hegemonic partnership of industry and agriculture flourished.

The development of a theory and methodology for understanding the changes within the period has been focused through a particular landscape context, in the case of this thesis the regional context of Ayrshire has been selected as the key area of study, though consistent reference has been made to other areas in Scotland, England and Wales when necessary to give a more contextualised view. The theoretical model of 'political' and 'vernacular' landscapes (Jackson 1985) has been utilised as the key model of understanding landscapes during periods of change. This has also been supplemented by a range of analytical techniques presented as datasets to allow for a more detailed understanding of the archaeology and history of the period. The theoretical and methodological models for understanding the age of transition are presented here against a landscape archaeology background which is a consistent feature of the entire work: the need for a theoretical backbone in studies of the recent past must be seen as paramount. Having said that, the adoption of a theoretical position espoused by a geographer and related to understanding the cultural landscape of modern day America does not necessarily fit within archaeological studies of the

past. This has led to a re-shaping of Jackson's primary division between the vernacular and the political forms of landscape to allow historical forces to be taken into consideration. Some of the following chapters have been presented here without literal recourse to the theoretical structure presented in chapter one, this however does not mean that the position has not been considered and taken into account.

The following chapters have been deliberately targeted on a particular view of the past, a view that has at its base an understanding of the effects of change in the social and cultural landscapes on the community. The impact on the lower orders of society was undoubtedly the most important side-effect of industrialisation and agricultural transformation. The aim here is to relate those changes in community life to an understanding of the mechanisms of change and the impact on the majority of the population. Consequently, although the primary focus is on settlement, due consideration is also expressed for the mechanics of change and the industries which developed and allowed that change to occur. Although reference is made to the church, state and landed classes, the principle aim of this work is to study change during this period by viewing society from the bottom up, rather than the top down. In consequence study of the role of entrepreneurs and inventors is not given such high credence here, though their importance is recognised. There is little doubt that landowners such as the Earl of Eglinton or entrepreneurs such as David Dale played a significant role in the formation of change, but it is argued here that this should not dominate interpretations of the past to the degree it has so far. The focus of many researchers, has tended to be restricted to personalities, inventions and large-scale industries of the past, with the majority of the population playing second fiddle. To be

an archaeology surely means an interest in everything that humans alter and change for themselves, a focus which views all human existence as interesting and worthy of research, from the agricultural cottar or industrial navy right up to a head of state. This work does not deal with the whole gamut of human experience, though it does aim to give some parity to the lower orders of society within the framework of political and venacular transformation.

Many of the examples used here have been adopted from outwith the study area in order to avoid the pitfalls of regionalism, however the major body of data and information has been drawn from the experience of the county in an attempt to emphasise the changing environment within a particular context. Ayrshire has received some attention in relation to its historic landscapes and sites (e.g. Hume 1966; 1988; Strawhorn 1959; 1979), including archaeological assessments of rural settlements (e.g. RCAHMS 1981; 1983) and surveys of industrial sites (e.g. RCAHMS 1991). Much of the focus however, has tended to come from economic and social historians. R H Campbell has recently suggested that "when the rural history of the lowlands is examined, attention is usually directed to the experience of the eastern counties" (1994, 59). It would appear that the western lowlands have failed to attract the levels of attention and research which they richly deserve. Although it is recognised that this thesis is not the first step in facilitating a change in geographic focus, it is clearly a chance to direct archaeological thought to the history of the recent past in an area where limited previous work has been pursued.

In many ways this thesis is a personal crusade which tries to unravel the fundamental dichotomy which exists within the discipline in relation to the study of the recent past. There are clearly problems in any holistic analysis of the post-Medieval or early industrial periods, not least of which is the lack of comparable data from other researchers. This has been hinted at above and will be pursued in the following chapters, however it is hoped that this will mark a small step in bringing together a more cohesive approach to studies in historical archaeology. After all, this is a period where archaeology can call upon a host of rich and varied sources of information - which are not available to *traditional* archaeology - to augment the range of techniques already in existence. It is also a period which witnessed the enormity of economic, social and cultural changes which fundamentally altered, not only the face of landscape, but the face of human existence. Arguably its effects were potentially more radical than any other period of change in archaeological history. The death of Feudalism and the rise of Capitalism have left behind an archaeology in need of analysis and interpretation, the role of this thesis is to recognise that fact and develop a strategy for dealing with it.

Chapter 1

Historical Archaeology and Landscape Studies:

Developing a Methodology

1.1 Introduction

This chapter is critical in establishing the internal structure of the entire thesis, for here the methodological framework and theoretical approach that will be prevalent in the following chapters will be established. The archaeology of historic landscapes has suffered from both external and internal indifference; from the lack of structured research that has until very recently permeated the study of industrial archaeology (see Chapter 3 for full discussion) to the lack of interest from traditional archaeologists who have viewed the archaeology of the recent past as the domain of business historians, economic historians and historical geographers. This, of course, has meant that the study of later historic and industrialised landscapes has suffered from a lack of critical approach and academic debate which acceptance by the greater discipline would have brought to the subject. This chapter will attempt to define the role of archaeology in the study of both agrarian and industrial landscapes of the post-Medieval and early industrial periods; in effect this will mean an assessment of the elements of the landscape, in order that the cultural past and the physical/natural components of landscape can be dealt with in a critical and rigorous manner. The route to this assessment will be accessed via a coherent method and theory: this chapter will compare the natural landscapes of the county of Ayr with the social landscapes of change within the area of study. The theoretical models of political and vernacular landscapes (Jackson 1985) will be assessed and employed in an attempt to access the complexity of the historical landscape by utilising them as a tool of analysis. It is also the aim of this chapter to introduce the research criteria and strategy which will be employed throughout the entire thesis.

1.2 The environment of change: understanding the physical landscape

Prior to any discussion of the physical/natural environment of the area of study, it is essential to delineate the bounds of the research undertaken in the following chapters. This study is focused on the county of Ayrshire, south-west Scotland and will deal in particular with that area, although some reference will be made to landscapes and sites elsewhere in Scotland and England. Ayrshire is located to the south-west of Glasgow sandwiched between the counties of Galloway in the south, Lanarkshire in the east, and Renfrewshire to the north. Its western border is defined by the coastline of this part of the country, facing onto the Clyde Estuary and the Irish Sea (see fig 1.1).

Ayrshire's "geographical situation and physical features undoubtedly have had a very strong influence on the character of the people and the development of the county" (Shaw 1953, 1). Although this is a somewhat dated view, the point is generally valid; the linking of the social landscape and the physical landscape is a crucial factor in any analysis of the historic landscapes of Ayrshire. This section of the chapter will deal with the natural and physical elements of this equation; the definition of these elements will be explored further elsewhere (see section 1.4).

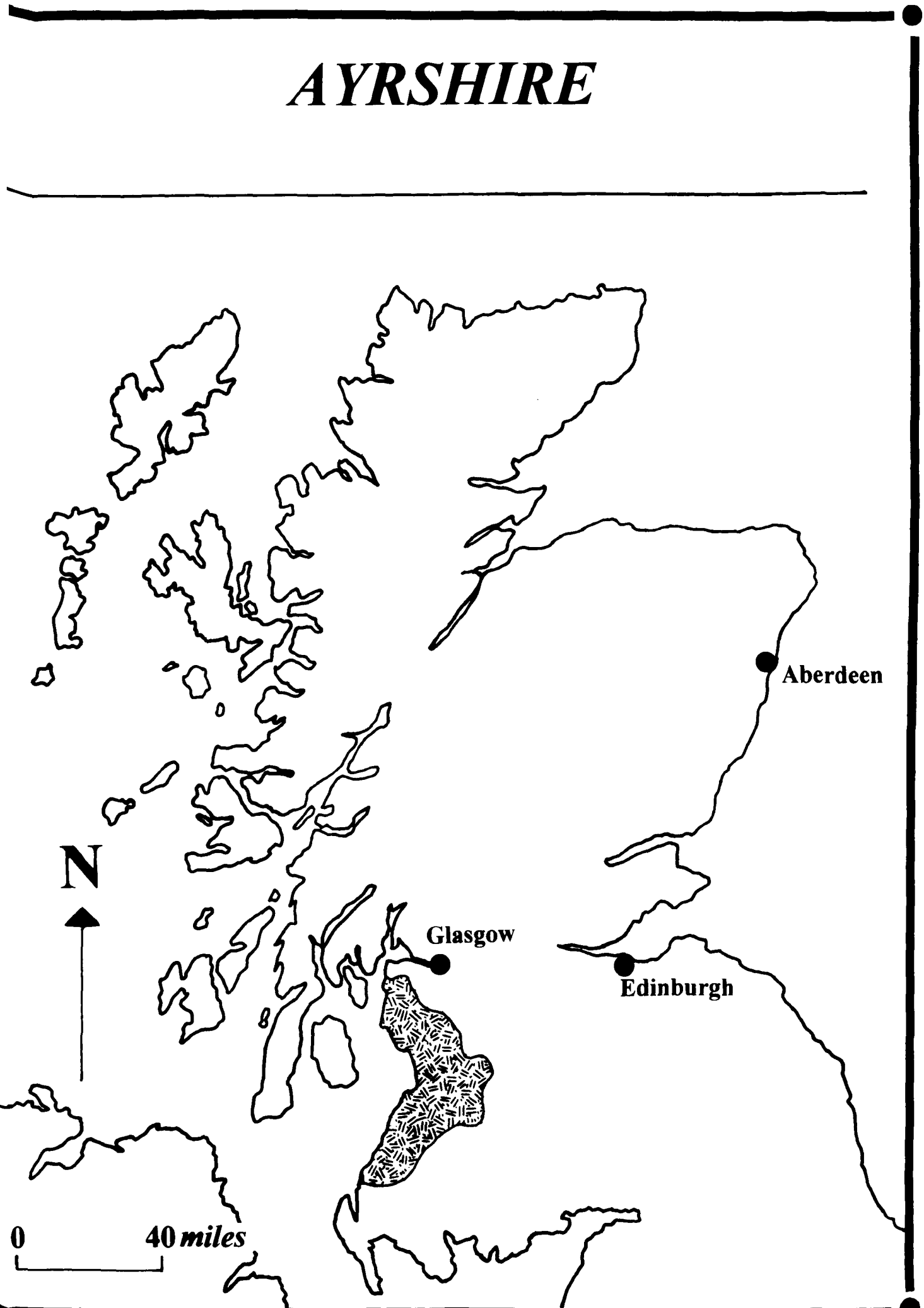

Figure 1.1 Location plan of study area within Scotland

Topographically Ayrshire varies considerably from sand dunes, raised beaches and small cliffs of the western seaboard to high quality dairy and arable farmlands of the interior of central Ayrshire, and onto the poorer quality pastoral lands of the eastern, northern and southern extremities of the county. This mixture of topographical environments is particularly noticeable in the southern parishes where high moorlands begin to dominate the landscape of not only the interior parishes, but strikingly, some of the coastal parishes as well. The upland areas are dominated by pastoral farming and woodland management schemes. The fact that the eastern extent of the county forms in effect a natural barrier helps in the words of Shaw "to increase the rainfall for the county to a level much beyond the level experienced by the coastal parishes of the county" (Shaw 1953, 3): This is aided by the close proximity of Arran, Kintyre and Ireland which, in effect, shelter the county from the ravages of the Atlantic. The existence of a series of geological fault lines, the most predominant of which is the Southern Upland Fault, 'have a well marked effect on the topography of the county' (Eyles *et al* 1980, 16).

The county is dissected by a large number of substantial river valleys, for example the valleys of the rivers Ayr, Irvine, Doon and Stinchar, which cut east to west across the county, and in general help keep the high quality farmlands of central Ayrshire well drained. This is not a mountainous region by any means, though the existence of relatively high areas of moorland in both the north, east and south is common. The existence of large volcanic intrusions, for example Loudoun Hill, tend to stand out and be clearly seen sitting above the rolling farmland topography of the county.

Geologically, the county's physical landscape is dominated by three distinct regions: with Carboniferous rocks prevalent in the northern parishes, Old Red Sandstone in the middle parishes and finally Lower Silurian in the southern parishes (Eyles *et al* 1980). This division in the solid geology is followed quite closely by the three districts or Bailiwicks which make up the county. "Namely, Cunninghame in the north, betwixt the county of Renfrew and the water of Irvine; Kyle, the middle, betwixt the waters of Irvine and Doon; and Carrick, in the most southerly, betwixt the Doon and the confines of Galloway" (Robertson 1820, 14). Although the northern district in the county consists basically of Carboniferous rocks there are deposits of Old Red Sandstone conglomerates along the coast between Skelmorlie and Saltcoats. This mixture is further enhanced by the presence of Basaltic Lavas and in the southern extent Productive Coal Measures. In the middle district the geology is much more mixed with the dominant Productive Coal Measures intermixed with Basaltic Lavas, igneous rock sheets, Platonic intrusions, Carboniferous Barren Red Coal Measures and Trias. In common with the northern district the southern sector is also encroached upon by Productive Coal Measures, however its solid geology is dominated by the lower Silurian rocks with a few large granite outcrops within it, particularly south of Girvan and south of Loch Doon.

The drift geology of the county tends to be dominated by clayey and sandy loams with mixed pockets of sandy soils particularly along the coast in relation to the raised beaches and areas of glacial sands, gravels and tills. There is also a considerable amount of boulder clays present associated with peat deposits which are relatively widespread, particularly in the upland pastoral areas. "Extensive areas of high-level

peat up to 12 ft (approximately 3.5 m) in thickness are found on the Ordovician rocks of the southern uplands to the north east of the Dalmellington-Carsphrain road, and on the Carboniferous rocks of the high moorland between Dalmellington and Cumnock (Headmark Moss, Martyrs Moss, Glaisnock Moss)" (Eyles et al 1980, 20). The relationship of agricultural practice to these deposits tends to follow a pattern of arable/dairy in the areas of good quality soils (in particular in Central Ayrshire) and pastoral/woodland management in areas of poor quality soil (northern, eastern and southern portions of the county).

A detailed understanding of the deposits of the county, in particular the solid geology is essential for this piece of research, as a comparative analysis of distribution of industrial landscapes against geological layers will form part of the general understanding pursued within this programme of research. For the moment, however, a general view of the geology will suffice, but in the forthcoming chapters this is expanded to give a more comprehensive understanding (see Chapters 6 and 7).

1.3 Development and changes: understanding cultural and natural landscapes

Landscape studies have taken up much space in the writings of historical geographers over the last two decades, a fact which is increasingly reflected within archaeological writing since the mid-1980s. However, there is clearly still confusion over how landscape studies can be applied, even Brian Roberts finds "The term landscape suprisingly difficult to define" (1987, 77). Although it is clearly important to understand what we are dealing with prior to developing a landscape theory for

Ayrshire, it is not the purpose of this chapter to delve into the methodology of application within archaeology, but to assist in the creation of a specific structure for this piece of research. To develop this theme further it is however important to base that theory upon solid ground; in this case the body of work already undertaken by geographers and historical geographers. It is postulated that, in turn, this will allow a greater development of understanding of the mechanisms of industrialisation of the rural landscape.

The concept of landscape is a relatively modern idea. Howard has assessed that prior to 1700 little interest had been expressed in the visual, "the concept scarcely having arrived". A lack of interest "shared even by Defoe and Fiennes" (Howard 1991, 25). Howard notes that this lack of interest can clearly be seen prior to this date and makes reference to surveyors like Tristan Risdon working in Devonshire in the 1620s, who were "much concerned with land, scarcely at all with landscape" (1991, 25). The interest in the aesthetics of landscape can be traced through the eighteenth century with a growing interest in the visual accompanied by an interest in the natural world. The whole idea of landscape and nature becoming intertwined and inter-related, the notion of sublime landscapes where humans were alien formed the central pillar in this conceptual, aesthetic understanding of environments within the psyche of human experience in Western Europe. The power of that construct was quite staggering, even as late as the mid-1970s geographers tended to stress the division between the natural and human landscapes (Haggett, Cliff & Frey 1977, 6-7). This analysis was beginning to be refined however, with the blurring of this division in landscape description by introducing the notion that human influence permeated the natural world far more

deeply (Evans, Limbrey & Cleere, 1975; Limbrey & Evans, 1978; Meinig, 1979). Geographers like Meinig were arguing that "landscape is related to, but not identical with nature. Nature is a part of every landscape, but is no more than a part of any landscape which has felt the impact of man" and that "the idea of landscape runs counter to recognition of any simple binary relationship between man and nature" (1979, 2).

At the heart of this discussion lies an important issue. For archaeologists the key question becomes: if no simple binary relationship exists between nature and human landscapes in the past, then how do we resolve the question 'is there such a thing as a natural landscape ?' By the 1990s a number of authors were realising this, and attempting to define a way of dealing with the thorny question of nature or culture. This chain of debate has led us to understand that landscape is not a finite term, "geographical areas really incorporate infinite landscapes. This has multiple and profound implications as we try to understand past cultural uses and perceptions of the environment" (Green 1990, 358). Perception becomes the key to understanding in this scheme of things. The question now becomes one of how to interpret the relationships evident within landscapes, if we are going to be able to digest the inter-relationship between nature and culture. For most archaeologists this notion of a purely natural landscape has a rather unbelievable ring to it. "The axiomatic contrast between nature and culture makes it logically awkward to pursue both goals simultaneously" (Ingerson 1994, 48). In the simplest of terms the nature-culture dichotomy forms a central pillar in the western psyche, the circular debates in many disciplines over whether humans impact upon, or adapt to, nature have remained a current feature

(Ingold 1993; Crumley 1994; Hirsch & O'Hanlon 1995: Schama 1996). It is by looking at the work of Crumley and Marquardt, in their 1990 paper entitled *Landscape: a unifying concept in regional analysis* that the notion is introduced of the landscape being constructed of two types of structures operating in unison: the socio-historical and the physical. The socio-historical is also the cultural or human landscape constructed of relationships of class, inheritance, political liaisons, agricultural regimes and community, which has been recognised since the beginnings of historical geography. The physical landscape on the other hand, specifically deals with physical structures which may or may not be within society's control, for example climate, topography and geology. There is a clear difference between the traditional understanding of natural landscapes and the physical landscape in this context. In past interpretations natural included all aspects of the environmental world from fauna and flora to land itself, and stood as a diametric opposite to cultural life. Crumley and Marquardt's (1990, 74) theoretical model attempts to get away from the confines of the culture - nature debate and introduce a more flexible model for understanding. If we examine the landscape utilising their model then the components of the landscape; natural (physical) and cultural (socio-historical) can operate at the same time, and sit comfortably together, sometimes impinging on each other, other times not. In fact this categorisation recognises that there is a constant interaction between categories. "Reliable and widely available evidence for the historical interrelatedness of humans and the environment may be read in the landscape" (Crumley 1994, 6). There are ample examples to support such a view, for example the locational positioning of pre-improvement townships in Ayrshire habitually located to maximise local topography for shelter (see chapter 5 for further discussion). On a

macro scale the Crumley and Marquardt model is effective, though they only make passing reference to human interpretation of landscapes. The relationship between nature and culture is the key to understanding landscapes, however that understanding is entirely dependant upon human agency and the creation of dialogue. In order to understand landscape it is essential to embody it, temporally and spatially. Meinig recognised that landscape was "an intricate, intimate intermingling of physical, biological and cultural features" (1979, 2), it is clearly unhelpful to view landscapes as having dichotomous relations within them.

Landscape is a complex phenomena "both variable in date and extremely complex in character" (Roberts 1987, 79-80), the need for a complex strategy for understanding the structure of the landscape is paramount to the development of a coherent archaeological approach to the past. After all, "every landscape is 'coded' and needs to be deciphered" (Meinig 1989, 101). It is this deciphering that fails in a system where black (human-made) and white (natural) are the only options. The need for grey areas where categories overlap is essential, after all the landscape is four dimensional, so our approach as archaeologists needs to be multi-dimensional as well.

Crumley and Marquardt have suggested that "landscape is the spatial manifestation of the relations between humans and their environments" (Crumley & Marquardt 1990, 73). This, although true, is only part of the story, as it represents a three dimensional approach that has permeated much of the literature on landscape studies over the last twenty years. It is imperative that a fourth dimension is introduced to this analysis. Green has attempted to introduce this by the use of Geographical Information Systems

(GIS) to landscape studies. He insists that "archaeological sites, in a sense, provide a mirror image of the landscape with their stratigraphic (fourth) dimension" (Green 1990, 360). What he is actually referring to is the temporal dimension that allows stratigraphy to work on site, and makes GIS an important tool in interpreting complex landscapes. Roberts goes along with this analogy between excavation and landscape and I see no reason to contradict either author, in fact I fully support any approach that adds a temporal dimension to analyses of the past: "the establishment of both relative and absolute chronologies is fundamental to all studies of the past" (Roberts 1987, 89). The Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS) have themselves recently been utilising GIS as a tool in the study of Medieval Or Later Rural Settlements (MOLRS). Their development of FESP (First Edition Survey Project), which seeks to utilise the information on MOLRS settlement patterns from both the First Edition Ordnance Survey maps and the current Ordnance Survey maps is very important. This is the first step in Scotland to the answering of a series of questions in relation to the survival and forms of settlement for the historic period. It may also aid in answering other specific questions raised in the recent past regarding the regionality of the settlement pattern (Atkinson 1995). This is of course a current theme in the study of landscapes of the recent past, with methodologies of analysis being created, taking the metaphor of stratigraphy out of the contexts of geology and archaeological excavation and employing them in the field of landscape studies. This has been effectively carried out by Alfrey and Clark at Ironbridge Gorge where they used the idea of a stratigraphic matrix to examine the entire landscape, "from river to culvert, field to waste-heap, cottage to council house" (1993, 3). This is a particularly important approach in terms of industrial landscapes as "all human

landscape has cultural meaning, no matter how ordinary the landscape may be" (Lewis, 1979, 12). Industrial landscapes represent the most complex of all archaeological environments. This complex relationship between humans and environments is succinctly defined by Roberts:

> "each generation inherits a landscape, much as an individual or a family might inherit a house; each generation uses that property, changing it, adapting it through a filter of use. Thus the inherited landscape, the inherited house, will contain a mixture of features, some of them relatively old, some relatively new, and by adding some completely new elements and changing or wholly destroying inherited elements, each generation bequeaths the present to the future" (1987, 80-1).

Roberts description allows some of the complexity of the issues facing archaeologists in this field to be developed, however the idea of a generation implies a chronological layering element. Portions of industrial landscapes do not occur in distinct chronological layers, but represent "a palimpsest of past activities, built one on top of the other" (Alfrey & Clark 1993, 4). This is Meinigs 'coded' landscape, a landscape temporally and spatially constructed, a landscape which is on the surface simple, but has an extreme complexity of change and alteration. Take for example the Royal Commission on the Ancient and Historical Monuments of Scotland's recent (1991-2) intervention to record the industrial landscape around Muirkirk Ironworks in Ayrshire. The complexity of the landscape recorded here took the RCAHMS by surprise (S. Halliday pers comm), and the results of their work speak volumes about the difficulty

in not only recording complex landscapes, but also making some sense out of them (see fig 1.2). The association of industries (ironworking, ironstone mining, lime quarrying and burning, tar making and coal mining) operating side by side and inter-relating with each other over time (the ironworks functioned between 1787-1923) has left a bewildering array of deposits across this landscape. This is further complicated by use of the area for sporting management which has had its own effect on the landscape.

Figure 1.2 Coal extraction and ironworking landscape, Muirkirk (source: RCAHMS)

Meinig sums this up and puts it into context: "any landscape is so dense with evidence and so complex and cryptic that we can never be assured that we have read it all" (1979, 6). Before moving away from the relationship between nature and culture it is worth re-capping and putting this into context. So far we have concentrated on the long-running debate over what really constitutes a natural/physical or human/cultural landscape without really mentioning the inter-play between them through time. A final question needs to be posed: are present day environments themselves "the result of continual, incremental change" (Burgess & Gold 1982, 4) ? Or is there a mechanism at work where nature is re-gaining the physical environment after abandonment by humans ? If we take the Muirkirk landscape as our example, then there are some possible conclusions to be drawn. The RCAHMS plan of the landscape (fig 1.2 above) gives the impression that the human, that is industrial landscape of waste bings, tip-lines, quarries, bell pits, tar kilns and miners rows is the dominant feature. However when this area is visualised it is clear that natural agencies are re-claiming the landscape, not healing, but obscuring the industrial scars. In reality, the answer becomes "yes" to both questions, continual incremental change is occurring, while at the same time, nature is re-gaining a foothold. Ingerson has recently discussed (1994, 56-60) the possibility of finding history in nature, particularly within undisturbed landscapes, she quotes Botkin as suggesting that "nature undisturbed is not constant in form, structure, or proportion, but changes at every scale of time and space" (1990, 62 in Ingerson 1994, 57). This is undoubtedly true, however the point is equally valid in relation to landscapes which have been disturbed as well. However this discussion has not really been about whether landscapes are natural or cultural, but more to do with the relationship and impact of humans on the physical nature of

landscape itself. Quite succinctly, "changes in the way that humans organise to produce their material lives quite obviously result from and give rise to changes in relationship with their physical surroundings" (Cosgrove 1984, 5). The question of whether a landscape is cultural or natural is really a red herring, the role of nature in the cultural sphere is just as important as the role of culture in the natural world: they are interconnected and inter-related by their very essence. As Ingold succinctly puts it: "the landscape is never complete: neither 'built' or 'unbuilt', it is perpetually under construction....always in the nature of a 'work in progress'" (1993, 162).

1.4 Landscape Studies: cultural and social landscapes

It is now time to develop the theoretical structure of the study further, that is the association between the cultural past and the relict landscapes of Ayrshire. In order to do this, a vehicle of understanding of the mechanics of landscape change is necessary; the use of the theoretical perspective of political and vernacular landscapes (Jackson 1985; 1986) requires assessment here. The work of "J B Jackson has brought attention to vernacular landscapes which he opposes to the political" (Howard 1988, 1). Jackson in his book *Discovering the Vernacular Landscape* (1985) develops the theme of two different types of landscape "based on differences of power and class" (Howard 1991, 18). The contrast in Ayrshire between political and vernacular in the post-Medieval and early industrial periods (that is prior to, and immediately after, the 'Improvements') is clear enough. If we take as an example Culzean Castle and its constructed sublime landscape and compare this with the pre-Improvement agricultural settlements of South Carrick the comparison is easy to see (see figures 1.3 and 1.4); the political landscape, a landscape completely designed by the elite classes,

stands in stark contrast to the vernacular landscape, a landscape "of the people, of the community" (Howard 1988, 2). This is an attractive theory which appears to work for the period of this study, that is the period of the Agricultural and Industrial Revolutions, where the changes within the landscape "involved a fundamental re-organisation of society's relationship with the environment and resources" (Cosgrove 1984, 5); a change that in Ayrshire (and elsewhere) meant a re-organisation of not only the form of landscape, but the also the structure of communities as well. The work of Fenton and Walker (1981) has indicated that wholesale change in social and cultural terms was clearly reflected in the re-ordering of not only farmlands, but also in the development of new sophisticated farm complexes to accompany improved farming practices; an adoption of design that reflected a conscious decision by estates to control and manage the entire landscape, including the social and the cultural spheres. It is the intention within this thesis to view how that change in both the agrarian and industrial spheres occurs, however before this is addressed it is essential that the core understanding of what really constitutes a vernacular or a political landscape is addressed. For this, we return to Jackson's work. In a short article in 1986 he summarised how the vernacular and political landscape differed in the past:

> "That is where we can draw one distinction between what I call the vernacular landscape - that of the village or rural community - and the aristocratic or political landscape of the crown and the nobility: the vernacular landscape seeks to include a small (and visible) territory essential to its survival and to its kind of agriculture. Whereas the political landscape largely ignores topography in favour of strategic or economic strong points" (1986, 69).

Jackson's distinctions are fundamantally based on differences in management systems, he suggests a variance between how the powerful classes operate in opposition to the approach of ordinary people. As such, his critieria are valid if somewhat restrictive. They only offer a division between community and lordly influence and take little account of class or chronological distinctions. If we adopt Jackson's clssification system, how does an industrial landscape fit within the theory? Industrial landscapes are the result of exploitation on a massive scale, for example in the founding of large ironworks. These are clearly not vernacular as they are generated, funded and executed by Capitalist elites. However, they lack aristocratic credentials in many cases, being the direct result of entrepreneurial initiatives and investment. Although Jackson does not mention entrepreneurial power as a central theme in his political landscape, a case could certainly be made on definition grounds (see below for further discussion).

A secondary criticism of Jackson's theory is related to the inability of his criteria to deal with change and variation in landscape form within an individual category or across categories. Within a specific area of landscape the contrast is not so clear between vernacular and political elements, between agriculture and industry. Meinig's notion that "landscape is a portion of the Earth's surface, related to, but not identical with, region, area, or geography" (1979, 3) is an important and relevant point. In this scheme of understanding we can see landscapes within landscapes. It is quite possible to view the rate of social change and cultural impact differently as we move from the macro to micro level of understanding within any group of landscapes or an individual

landscape. This is particularly cogent when historic landscapes are considered, especially within those macro landscapes where several distinct systems of use form parts of the greater picture for study. For example the iron industry in Ayrshire was constructed of a number of inter-related industries functioning as a single entity (iron production, ironstone mining, coal mining, lime quarrying and processing and in some instances clay quarrying and brick production). The location of these industries, and by extension their settlement pattern, varied depending on the industry itself, its chronology of use, its geographic location (from the valley floor to the extremes of the surrounding moorlands) and its association with nearby agricultural systems.

Figure 1.4 Balnowlart Hill, South Carrick (source: RCAHMS)

Figure 1.3 Culzean Castle and policies

In chapter 7, a case study of the associated settlement patterns of Dalmellington, Muirkirk and Lugar Ironworks this is developed further. For the moment though, it is useful to develop part of that work in light of the discussion above. We may take as our example the coal mining settlement of Benwhat Village, which lies high above the valley floor in a very exposed position on the edge of the moor, to the east of Dalmellington Ironworks. The settlement "largely ignores topography in favour of a....economic strong point", fitting in with Jackson's (1986, 69) criteria for a political landscape. The political nature of the settlement pattern would appear to be abundantly clear (see figure 1.5); five rows of around eighty-four conjoined ashlar-faced and brick-built cells, each measuring 5 m by 5 m with a fireplace in the southern gable. Entrances face onto a single track road and middens lie opposite each cell; the track in turn links up with the Corbie Craigs ironstone pits. The village was "built around 1850 by the Dalmellington Iron Company" (Hothersall 1989, 7) and finally abandoned in 1951. Its general location within the landscape appears to relate more to the siting of the collieries, than the environmental needs of the settlement itself. As Farrell summarises:

> "The proximity of the village to the iron pits typified the Dalmellington Iron Company's policy of building their miners' accommodation as near as possible to their workings, with remoteness and easy access for the villagers a secondary consideration" (1983, 5).

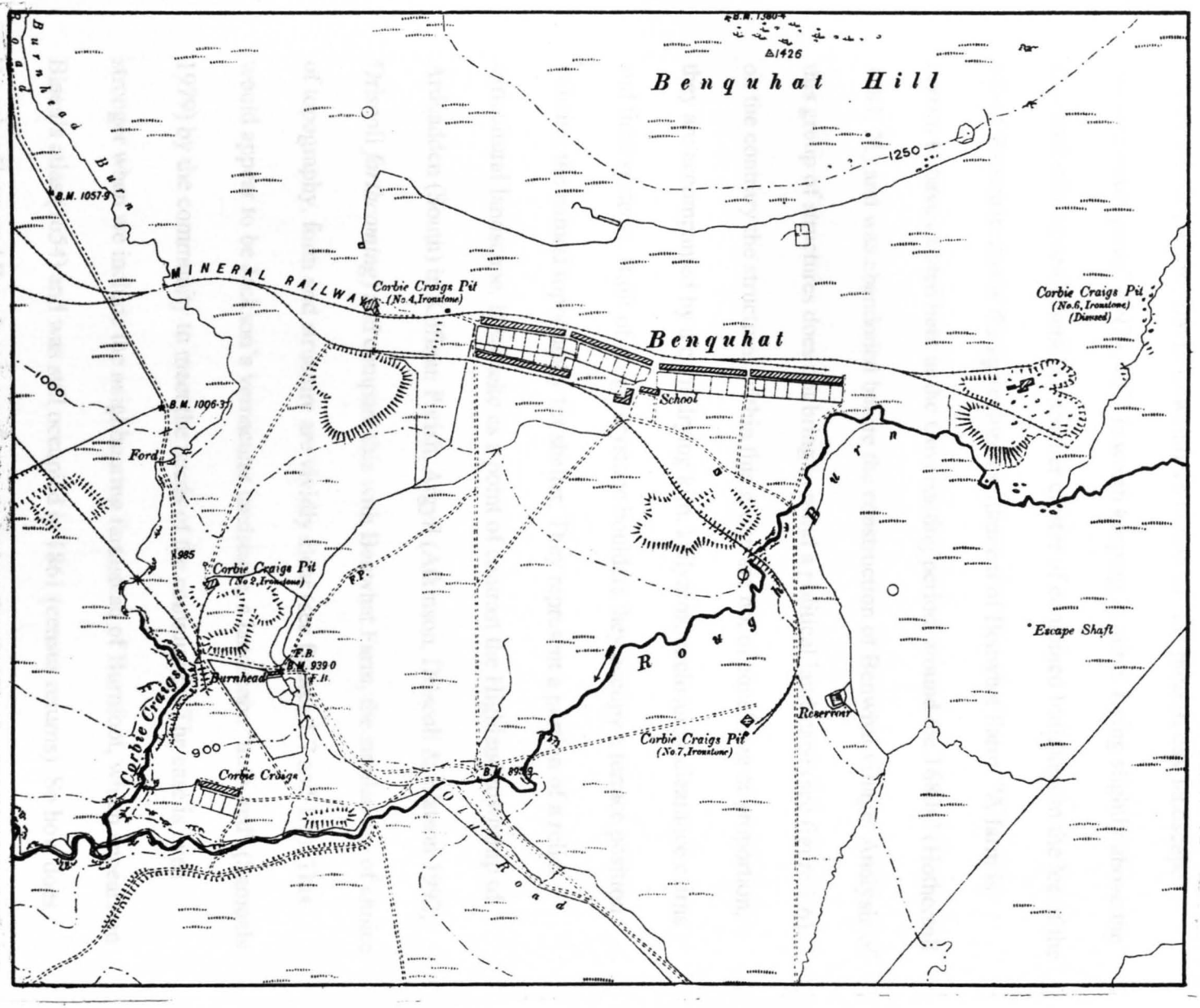

Figure 1.5 Benwhat Village, Dalmellington, 1897 (source: Ordnance Survey 1897)

This is a picture reflected throughout the county (see chapter 7), and is clearly the product of a culture controlled by ideology, by an elite of landowners and coal-masters producing a specific politically motivated settlement pattern. However this is not the whole picture, David Lowenthal's notion of "the present day landscape evoking many pasts" (1979, 107) is worth keeping in mind. Lying slightly above the Benwhat mining settlement is a smaller cluster of conjoined buildings in the lee of the hill of Benwhat: this is the agricultural settlement of Benwhat Farm. "A farm is known to have existed here in the Covenanting period, around the 1680s" (Hothersall 1989, 21) and was abandoned before the construction of Benwhat village. Analysis of this group of structures does not bring to mind a political landscape (see figure 1.6), on the contrary the structures within this group are not of equal size or proportion, they are accompanied by a corn-drying kiln, kailyards, enclosures, clearance cairns and field systems. Built of rough drystone boulders they occupy a terrace position utilising the natural topography for shelter. They represent a portion of a relict agricultural landscape. If we take as a point of contrast the Highland township of Ardgadden (South) in Kilfinan Parish, Argyll (Atkinson, Driscoll & Watson 1992; Driscoll *forthcoming*) and compare this with Benwhat Farm, the similarities of choice of topography, form and structure are vividly clear (see figures 1.7 and 1.8). This would appear to be Jackson's vernacular landscape, a landscape "authored" (Samuels 1979) by the community to meet the needs of the community. The case is even stronger when we include the neighbouring farmstead of Burnfoot, which appears on Blaeu's atlas (1654) and was still occupied in 1861 (census returns). So how does Benwhat Farm and Burnfoot Farm figure in Jackson's criteria of political and vernacular landscapes ? Clearly we have difficulty in setting these settlements within

a political framework, it would appear to have more to do with a vernacular landscape seeking "to include a small (and visible) territory essential to its survival" (Jackson 1986, 69). On the other hand, the settlements' existence can only be seen as a result of political forces, shaping the landscape. After all, the pre-Improvement agricultural landscape was also partially a product of such aristocratic power and influence. There is no easy resolution to this; Jackson's theory, although effective in contrasting the differences apparent between elite and non-elite groups within landscapes, lacks definition when dealing with contemporary industrial and agricultural activity. To refine Jackson's theory further we need to specifically focus on the problem area. In other words, we need to be able to understand the forces at work and the mechanics of change in operation during the construction and maintenance of historic landscapes.

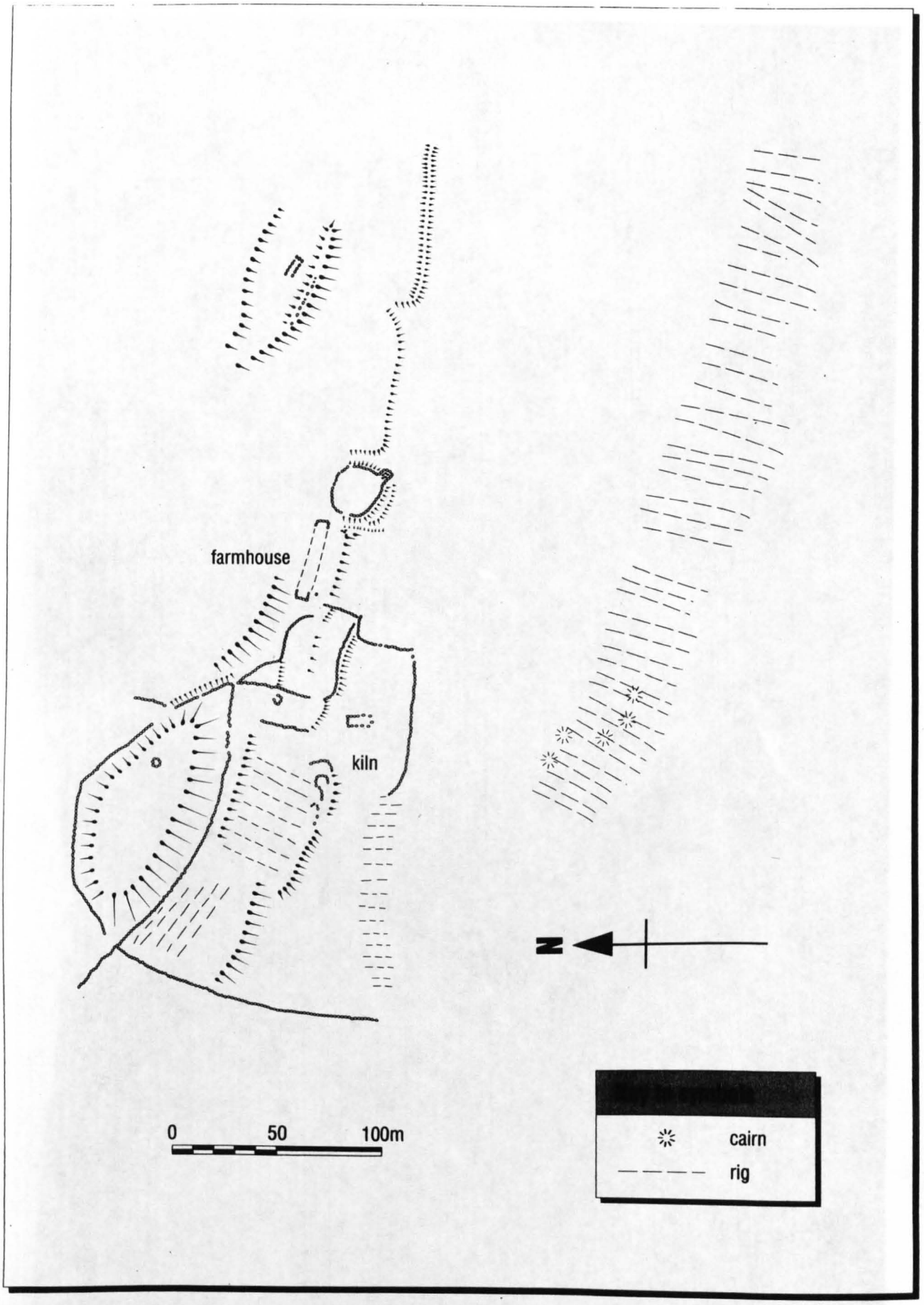

Figure 1.6 Plan of Benwhat Farm, Dalmellington (source: Hothersall 1989)

Figure 1.7 Ardgadden South township, Argyll (courtesy of S T Driscoll)

Figure 1.8 Benwhat Farm, Dalmellington

1.5 Understanding landscapes of change

Howard has suggested that "there may be a process at work whereby the vernacular landscape becomes appropriated by the powerful classes, and thereby turned into a political landscape" (1991, 18). Does the Benwhat landscape fit this description ? We can interpret this in two inter-related ways: physical appropriation and ideological appropriation. At face value the mining settlement itself did not exist prior to entrepreneurial interest which led to its establishment. It was therefore developed by a section of the powerful classes to meet their needs, in this case economic exploitation of geological resources. Though the agricultural landscape did exist prior to, and in the case of Burnfoot Farm, in conjunction with, the new industrial structure. This takes us back to Crumley and Marquardt's argument (1990), if we accept that all landscapes are socio-political then the landed classes did physically appropriate an existing political landscape; the portion of moorland in which Benwhat Farm and Burnfoot Farm operated as core agricultural units in the post-Medieval environment. The alteration of that landscape's agricultural use, changing into a landscape of economic exploitation could certainly be justified as a physical appropriation by a different elite group.

Our second option is to view Howard's statement on an ideological level. If he is suggesting that there is an ideological change, an appropriation of the pre-improvement culture by the landed classes, then this needs to be quantified. The alteration of the social base from agrarian small-holding townships to large scale exploitation of industrial resources was certainly generated and sustained by the

landed classes and industrial elites. The corollary of that change, from a culture based around agrarian eco-systems and re-use of environmental sources to a culture of destruction of resources and exploitative wage economies was a change in the very fabric of society. However, we need to understand that the landscape we are dealing with is "an ideologically-charged and very complex cultural product" (Cosgrove 1984, 11). As such the transition between the needs of pre- and post-Improvement/industrial culture cannot be qualified as a simple displacement of one management system by another. The impact of that ideological appropriation went far deeper. To understand this further we need to view the change in culture from the perspective of the its impact on the individual, as well as its impact on society. In terms of the individual, the removal of decision making on the form and layout of settlements and their choice of location in the landscape was a powerful alteration to cultural life. Its surplanting by a new hegemonic vision of 'model' housing (see chapter 7) located not to maximise shelter from the elements, but to maximise economic returns, was a profoundly pervasive cultural change. That impact on the individual's appreciation of the land they knew and dwelt within must have been a profound and deeply felt experience.

The Benwhat landscape was able to retain something of its earlier appearance within the developing mining landscape. The building of the first 20 houses (the Laigh Row) for ironstone miners in the early 1860s in an essentially agricultural landscape must have been an extraordinary juxtaposition to Thomas Dempsters' (shepherd at Burnfoot Farm) perception of that landscape prior to construction. In contrast, the re-location of those miners and their families who worked and lived there would also

have effected their own cultural mind-sets. Within landscape studies Yi fu Tuen has come closest to this. In the introduction to his 1979 paper *Thought and landscape* (in Meinig 1979, 89-102) he inadvertently hints at what may be the reality:

> "Landscape is not to be defined by itemising its parts. The parts are subsidiary clues to the integrated image. **Landscape is such an image, a construct of the mind and of feeling**" (89, *my highlighting*)

Although Tuen's reference is aimed at perspective and understanding of landscapes in general, the point still remains valid. The complexity of cultural and social change is a direct product of Tuen's point, the role of human agency within the landscape during periods of great social upheaval lies at the core of some of the complexity of historical landscapes. Appleton's claim that "landscape provides a record of practices of the societies who have successfully occupied them" (1975, 12) seems at once to be a self-evident truth and a glaring generalisation. The point is not to recognise that landscape is a palimpsest of the social and cultural past, but to understand why it is "an accumulation" (Meinig 1979, 44). After all "landscape study is [sic. *should be*] a companion to that form of social history [*and archaeology*] which seeks to understand the routine lives of ordinary people" (Meinig 1979, 6: *my emphasis*). This is the central theme of this thesis, the archaeology of societies' change as viewed via the impact by the powerful classes on ordinary peoples' lives. However, understanding the routine lives of ordinary people is more than simply appreciating changes imposed from above. After all "landscape is the World as known to those who dwell therein, who inhabit its places and journey along the paths connecting them" (Ingold 1993,

156). The implication being that all human beings, whether they are landowners, coal-masters, shepherds, tenant farmers, miners or tinkers are a product of their cultural and social milieu, as such their understanding of a given landscape will differ considerably.

So far we have discussed Jackson's theory of political and vernacular landscapes in relation to the contrast apparent in transitional industrial landscapes. Before moving on it would be worthwhile to review that same theory during the main phase of 'Improvements' in the agricultural landscapes of Ayrshire (This should be seen as a general discussion at this stage which has been developed further in chapter 4 & 5). First of all we need to re-cap Howard's statement: "there may be a process at work whereby the vernacular landscape becomes appropriated by the powerful classes, and thereby turned into a political landscape" (1991, 18). If we accept that the transition and change activated within the period of the Improvements was generated and fuelled by the landed classes, can we then see the act of appropriation of the pre-improvement vernacular landscape by them and its alteration into political landscape of the post-Improvement period ? The period of the Improvements can be seen as a turning point in the transition of the rural landscape, of that there is little doubt. However does that transition imply that the entire agricultural landscape of the county became a politically-derived landscape ? If we take a look at the Ordnance Survey 1st edition series maps for the upland parishes in the south of the county, in particular the areas of South and North Carrick, there is certainly a case to be made that the transition in farming practice reflected in the form of settlements and field systems was not undertaken across the board. Settlements like Clauchrierob (see also chapter

5) sitting on the edge of the Galloway Forest show the characteristics of small vernacular landscapes with sub-circular field patterns (see fig 1.9), while others indicate the archetypal characteristics of a changing environment like Auchairne in Ballantrae parish with its radial sub-rectangular field pattern (see fig 1.10). The form of changing field pattern, where the sub-circular form of enclosure are altered by the straightening of boundaries around field systems is characteristically present. An intermediary sub-rectangular form occurs prior to the typical rectangular pattern which is still very visible today. This transitional typology of enclosure has been reflected in the work of the RCAHMS on the Waternish Peninsula, Skye where the same forms were evident, with the sub-circular variety noted as the earliest form (RCAHMS 1994). There is no supporting evidence of transitional forms of enclosure from lowland areas (i.e. high quality arable lands) in Central Ayrshire, though it is there in the marginal zones of the county. So how do we assess that change in form. Does the existence of the early form of sub-circular boundaries denote pre-Improvement enclosure ? The considerable body of historical and contemporary evidence would suggest not, so we are left in a position where these early forms of enclosure must be the result of changes (i.e. Improvements) in the post-Medieval landscape. This develops a final question which needs to be addressed. Does the alteration of the face of the landscape by intake of common pasture and waste lands, the improvement of drainage regimes and enclosing of fields in neat rectangular patterns constitute the loss of the vernacular ? For lowland high quality arable lands it probably does (see RCAHMS Kyle survey and chapter 5), however the slow pace of change in marginal areas tends to imply that the vernacular landscape does not become as politicised during the Improvements and beyond. There are a number of

very cogent reasons for this which are developed in depth in the following chapters, however for the moment it is worthwhile indicating what they consist of. In general, the pace of change in lowland environments was necessitated by the need to increase production levels on the better quality land; this was reflected by a transition in the economy of marginal areas, particularly the upland zones, with the abandonment of mixed arable and pastoral economies in favour of a purely pastoral economy which in turn led to the combining of farms and the depopulation of these areas. A further element of this was the growth of communication and transport links in these areas. The development of toll roads, railways and canal systems were limited in southern Ayrshire, whereas their growth in central and northern parts of the county facilitated agricultural as well as industrial development. The growth of manufacturing towns such as Kilmarnock had the added bonus of opening up markets for agricultural produce and helped fuel the Improvements movement. In consequence the relict arable/pastoral landscapes of the upland zones, particularly the inland parishes, did not suffer from the same pace of change, their evolution was characteristically slower. Without transport infrastructures radical changes in economic development in areas of low quality land were essentially unlikely. These areas instead remained on the very periphery of the settlement pattern. Therefore the vernacular was appropriated by the landed classes in the ideological or cultural sense, but that change had a lesser effect on the physical nature of the settlement pattern within the upland zone.

Political and Vernacular Landscapes: a final comment

Before moving on, a final comment on Jackson's theory is essential. To access the relationship between landscape and community it is essential to go beyond the level of analysis within Jackson's model. In his model the relationship is essentially one way between the elite (political) and the community (vernacular), an imposition of ideological will from the above to the bottom. The juxtaposition of vernacular landscapes and communities with 'political will' may not be so structured in reality. To go back to the case of Benwhat Village for a moment, although there is an undoubted political element to the establishment of the settlement this in itself does not allow for an understanding of how that community operated. The Dalmellington Iron Company certainly built the village, it imposed a wage economy and even constructed a company shop, it undoubtedly regulated the workers time on a shift basis, it even controlled the education of the workers children by establishing a school, however it is equally clear that the Benwhat community lived beyond the confines of that political structure. The vernacular as expressed through the social lifes of the community was central to its existence. Farrell in his brief discussion of the history of Benwhat and Corbie Craigs suggests that the communities were "almost without exception followers of the outdoor life" (Farrell 1983, 15) they formed their own football teams, athletics clubs, held dances and formed brass bands. In essence they, that is the community, "sought to include a small (and visible) territory essential to their survival". If this is the case, then a counter-appropriation may have existed within communities, an appropriation of the political by the vernacular. The vernacular nature of landscapes extends beyond the limitations of architectural traits,

it exists within the very essence of human occupation, within social and cultural life. I would therefore contend that vernacular influence has always formed a crucial counter-balance to political will and that the relationship between them is only occasionally well defined within the surviving remains of occupation sites or landscapes.

Simplistic divisions between political and vernacular influences and their affect on the cultural landscape of the past, although workable to a degree, lack the fine tuning required to appreciate the complexity of the cultural past. In many ways there is no binary relationship between political will and vernacular influence, they operate as categories which sometimes inter-relate, sometimes clash, but are always inter-woven in the fabric of cultural life. Landscape change was formulated and acted upon by elites during the Improvement/industrialisation period, but so long as non-elite communities did not affect the political will, vernacular traditions existed within the structure of change.

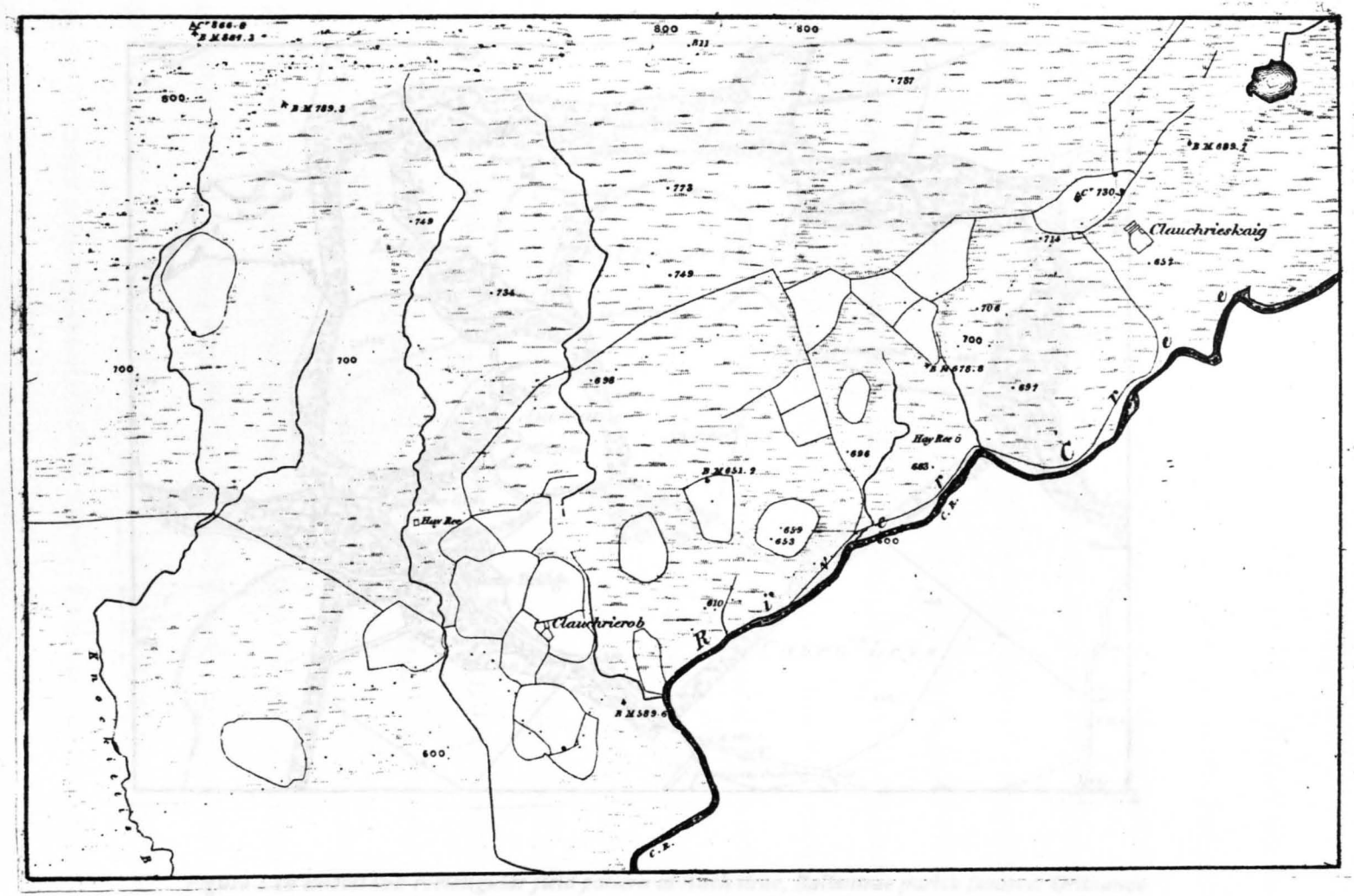

Figure 1.9 Sub-circular field systems at Clauchrierob, South Carrick (source: Ordnance Survey 1855)

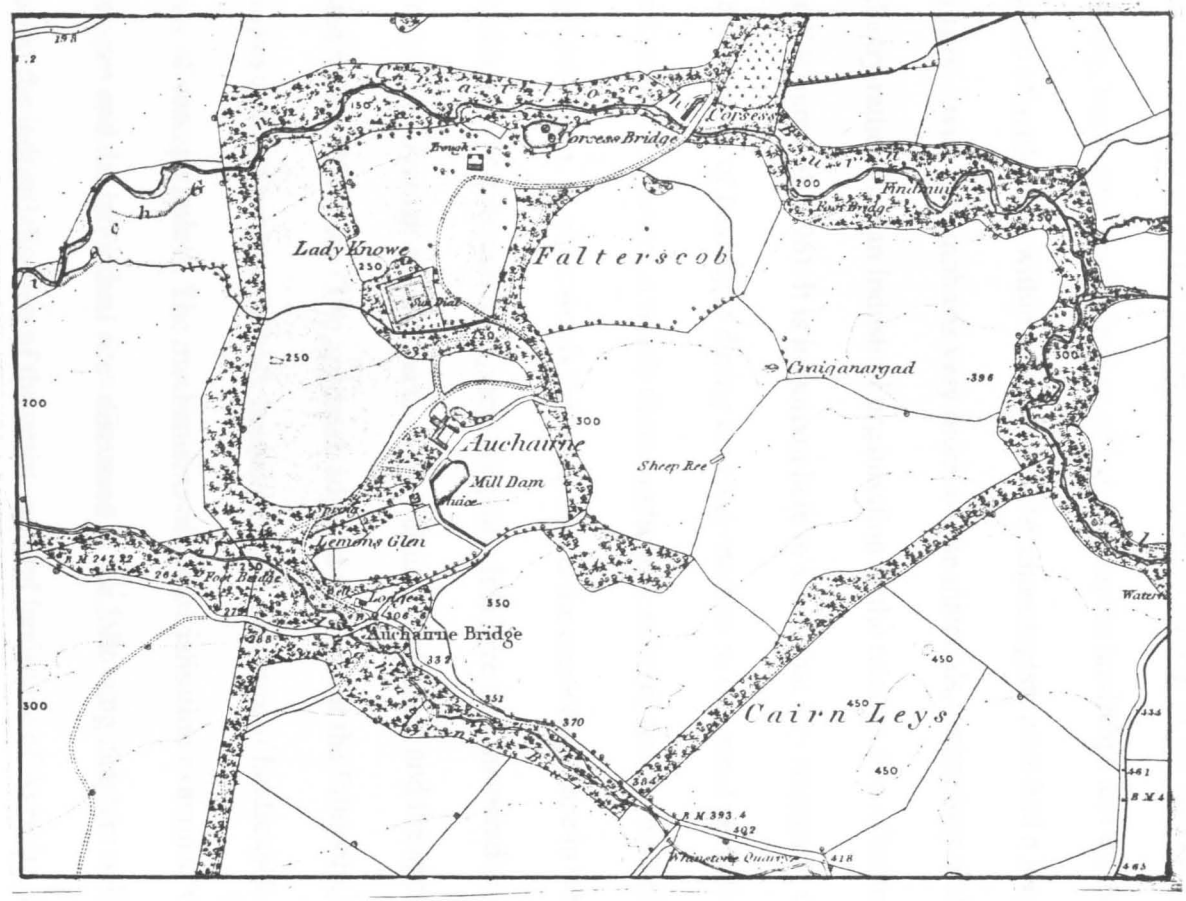

Figure 1.10 Radial sub-rectangular field pattern at Auchairne, Ballantrae parish (source: Ordnance Survey 1855)

1.6 The structure and criteria of research

At the very heart of this study lies a series of unequivocal assumptions about the need for research in particular areas of what can be described, for lack of a better term, as the industrialisation of the rural landscape. It is not the goal here to solely discuss the industrial archaeology or the agricultural settlement pattern of the region (Ayrshire) in its entirety, but to discuss the impact of industry on the landscape and on the social formation of settlement within that context. "Archaeologists have had a long interest in industry....with the emphasis very much on the materials, technology and artefacts of industry rather than an industrial organisation or the relationship of industry and society" (Grant 1987, 96). It is important here to stress that any attempt to understand the development of landscape during the early modern to industrial periods is entirely dependant on the context in which those landscapes existed, and the historic processes acting upon them. In other words the landscape is the contextual base in which the interaction of a society and environment occurs. It is here that the paradox exists between total coverage of all aspects of the cultural landscape, and the approach adopted within this study. The approach adopted throughout the following chapters will mean detailed analysis of both landscapes and elements of landscapes taken from a series of vantage points. The mechanisms of industrialisation examined within those landscapes and the individual sites discussed in the following chapters will not represent the industrialisation of the entire cultural landscape of Ayrshire, but will focus on a number of themes redolent of that transition between purely agrarian economies (vernacular landscapes) and an industrialised agricultural economy (political landscapes). Paradoxically, in order for the methodology of assessment and

analysis to be effective a degree of flexibility is essential to allow the greater picture of the environment of transition to be achieved. The central theme of this work is to understand the mechanisms of change and transition in the post-Medieval and early industrial periods, particularly in relation to the settlement pattern, and not to produce a detailed cultural history of Ayrshire.

The relationship between agriculture and industry is pivotal to our understanding of change and transition before, during and after the 'Improvements'. To access this encoded information it is essential to select areas of study where the basic information of change has survived. It is quite clear from the analysis of the first edition Ordnance Survey data (1855-57) that the distribution of industry is fundamentally different on the low, medium and high quality agricultural lands of Ayrshire in the 1850s. The area of archaeological survival is in the poorer quality uplands, the mainly pastoral regions of eastern and southern Ayrshire. Consequently these areas become crucial for the identifying and analysis of relict landscapes, that is the landscapes of both agricultural and industrial change. The link between the expansion of industry and the re-organisation of agriculture is a central theme of this study, consequently a methodology for dealing with both sectors of the developing landscape is essential. The use of the theoretical metaphor of vernacular and political landscapes will be integrated with research across a number of disciplines to effect a coherent understanding of this period of dramatic social, cultural and physical change within the landscapes of Ayrshire. This work will be integrated with a detailed understanding of the archaeological remains of the period 1600 to 1870, in effect to produce an archaeology of the 'Improvements'. The term 'Improvements' should be taken to mean

the transition between pre-Capitalist and post-Capitalist economic development and the effect that transition had on the social and economic structure of Scotland.

1.7 A structured analysis

The construction of a structured analysis on four levels will allow the context of transition and landscape/site histories to be developed concurrently. The study has been constructed via the following four analytical levels:

1. National Scale - It is crucial not to view Ayrshire as an isolated regional area without any contact with the wider world. The county was, and is, a sub-region of a greater country, so analysis must take what happens outwith the confines of Ayrshire into account. This is not simply applicable to the results of surveys, excavations or academic debates, but must also take into consideration the very structure of the study of the recent past. The contexts in which historical archaeology in this country have been engaged are of equal relevance with the results of their deployment. The following chapters deal specifically with the context of work in this era:

Chapter 3 When is an archaeology not an archaeology?: the development of Industrial Archaeology

Chapter 4 Settlement and domestic industries: chronologies of form and structure

2. Regional Scale - this covers the entire area of research, and is the primary level of contextual analysis which will allow the temporal and spatial relations between

landscapes, sites, agriculture and industries to be fully assessed. The following chapters deal in detail with this aspect of the study:

Chapter 2	A social and economic history of Ayrshire, 1600-1870
Chapter 6	An archaeology of Improvement: the role of limeburning in the transformation of the rural lanscape
Chapter 7	Iron, Coal and the Industrial Settlement Pattern
Chapter 8	Ayrshire 1600-1870: overview and conclusions

2. Target Area Analysis - the choice of target areas was highly dependent upon the range of field remains. Three target areas were selected for analysis where surviving remains of agriculture, industry and associated settlements could be integrated and developed. In the case of change in the agricultural landscape North and South Carrick were selected as a key area for study, whereas change in the industrial landscape was specifically targeted on the iron and coal industries in eastern Ayrshire. Three areas were selected for further work: Dalmellington, Muirkirk and Lugar Ironworks and their associated landscape of support industries. The following chapters deal in detail with this aspect of the study:

Chapter 5	De-constructing agrarian settlement forms: with specific reference to MOLRS sites in southern Ayrshire
Chapter 7	Iron, Coal and the Industrial Settlement Pattern

3. Site Scale - this is the most basic of all levels of analysis and allows the answering of purely archaeological questions. It was crucial here to attempt to establish relative chronologies, it is the integration of this level of analysis with the above levels that allows the creation of space, time and typological relations to be fully developed. The following chapters use the information from sites to enhance analysis within the study:

Chapter 4	Settlement and domestic industries: chronologies of form and structure
Chapter 5	De-constructing agrarian settlement forms: with specific reference to MOLRS sites in southern Ayrshire
Chapter 6	An archaeology of Improvement: the role of limeburning in the transformation of the rural lanscape
Chapter 7	Iron, Coal and the Industrial Settlements Pattern

"The industrial landscape in its own right can also constitute a class of historical evidence" (Alfrey & Clark 1993, 3). This is undoubtedly an accurate summation of the role of the landscape as a vehicle for transporting historical development through time. The same applies to historic settlement landscapes as well, consequently an approach is needed that will enable the accessing of the historical code and manipulation of the data enshrined. The construction of data bases is essential when dealing with large complex landscapes, as the management of data allows analysis to be carried out. The understanding of the landscape via data manipulation is essential if the perfunctory approach which sees historic landscapes as too complex is to be avoided. A series of data sets have been developed to allow clearer analysis of

distribution and form in the landscape. These databases include information which has not been included within the text and are therefore presented at the end of the thesis for consultation.

In establishing the framework of research within this study one key area of difficulty stands out amongst the rest. Due to the lack of work in this period the establishment of absolute chronologies is now a major problem. The resolution of this is clear enough, the need for coherent research programmes on MOLRS sites, which would include excavation and scientific dating techniques, is essential. This is not possible within the confines of this study. Arguably, it can be partially resolved, by the utilisation of cartographic evidence and the construction of rough chronologies from map sources. The county of Ayrshire surveyed by the Ordnance Survey between 1855-57 and covering 72 sheets is the primary source for constructing relative cartographic chronologies for the region in question. Although there are clearly many problems associated with using map evidence as a direct reflection of chronology it is an essential first step. The terminology within the first edition series (OS 1855-57) is very specific in describing the nature of the industrial sites and settlements, for example the division between sites in use and out of use is clearly implied. If we take the example of limekilns, those in use are constantly described as 'Limekiln' or 'Limekilns', whereas those that have gone out of use are consistently described as 'Old Limekiln' or 'Old Limekilns'. This difference is witnessed across all the categories of monument plotted within the subject area, likewise all settlements can be defined as either roofed or unroofed. There are problems here however; the Ordnance Survey followed a practice of detailing any structure which was roofed as occupied,

and consequently shaded on the first edition series. This meant that structures which had been abandoned but remained roofed appear as occupied. Though this is the case, the more general distinction between roofless, ruined buildings and newly deserted and occupied buildings still holds firm. Those distinctions can often be clarified further by recourse to the Ordnance Survey Name Books. This fact is integral to any analysis of the historic remains of Ayrshire as this consistency of description allows a chronologically based distinction to be derived. This chronologically-based distinction needs to be clarified, since only an inferred, rather than absolute, chronology can be constructed. There is a strong parallel here between the use of this cartographic relative chronology and the use of a stratigraphic relative chronology used during excavation of archaeological sites. So while Roberts sees excavation as "the micro-dissection of a small-piece of landscape" (Roberts 1987, 79), this methodological approach is presented as the tool for dissecting a large piece of landscape and accessing earlier layers or periods. This therefore, allows us to assign *terminus post quem* dating to the out of use category of sites, the old limekilns. Cartographic evidence can play an important role in developing a methodology of analysis and supplying a chronological perspective which is currently missing. In this respect the methodology proposed here is similar to that currently being pursued by the RCAHMS in their First Edition Survey Project (FESP). Differences are however evident, for example it is not the intention within this methodology to utilise GIS databases, although it is recognised as a major innovation in the study of landscapes. Nor is it the purpose of this methodology to compare Ordnance Survey surveyors 'hit rates' (RCAHMS terminology) for information gathered from the first edition series to the current Ordnance Survey series. It is the aim here to utilise the first edition

information and work back through earlier cartographic sources and relate this to the surviving remains on the ground where possible. The creation of a system of analysis based on the results of survey and assessment work on key target areas is utilised as a statistical base in the assessing of form, dimensions and associated features of different categories of site in any given landscape. Cartographic evidence is then introduced within selected categories of site as a comparative tool to, in effect, produce relative chronologies for each category of site where possible. This is an outline summary of the methodology; for full details see relevant chapters. The utilisation of map coverage for the county prior to the Ordnance Surveys first edition series of the mid-nineteenth century helps to supply that relative dating sequence, particularly in relation to the settlement pattern itself. However, it is quite clear that the use of Armstrong's (1775) and Thomson's (1828) maps of Ayrshire, supplemented by estate plans, will only enable the construction of rough chronological maps of surviving sites and landscapes from the eighteenth century onwards. Though other, and in some cases earlier, map coverage is accessible, in particular Roy's (1749-55), Blaeu's (1654) and Pont's (1590), there are problems in utilising these sources as accurate guides, though arguably they do help to support the case for the age of certain sites. This is developed further in Chapter 5 in relation to the Carrick sites where early abandonment of sites and survival of remains aids in the analysis of settlement form prior to transition.

1.8 Research Criteria

In all approaches to landscape studies the definition of the sample area for research varies considerably, as Parsons points out "most archaeologists have a sense that the term 'region' connotes a fairy large area" (1990, 10). For this study it was important to have an area of research that fitted within strict criteria dominated by the number of sites it would be possible to assess as part of a doctoral thesis. The major criteria for researching this study are given below:

1. A region that offered a number of environments where change could be assessed, i.e. lowland, upland, coastal and inland. It is important here to emphasise the necessity of a varied approach in terms of the types of landscapes looked at. Industry and agriculture obviously function differently where the environmental and social contexts differ considerably. This is done basically to avoid the pitfalls of targeting geographically and topographically similar areas, where local analysis could get caught up in historically specific local issues and therefore lose any chance of an overview. In other words the primary criteria of this research are to identify how industries and settlements function on a local level within their specific social, environmental and culture contexts, then take a step back and view what happens at the greater regional level.

2. A region that had a manageable number of sites. This could be seen as an easy way out of an awkward situation; however, if the sample number of sites had been too few the greater overview could not have been achieved without substantial shortfalls in

method. It has not been the goal of this research to trim the number of sites within the regional area to a manageable number. The research strategy was instead tailored to fit the level of archaeological remains rather than the other way round. This is an important point as the level of analysis undertaken over a three year research programme must be limited by the time period itself. Consequently a national analysis of historic landscapes could not be seen as an option.

3. An area which had good quality survival of remains, especially remains of settlements which constituted landscapes for both vernacular (pre-improvement agricultural) and political (pot-improvement or industrial) landscapes and the ability to relate those remains to the changes in settlement pattern and industrial development on the ground was essential.

4. An area that had a reasonable coverage in terms of cartographic material relating the pre- and post-Improvement periods. This was an important point if the relative chronologies that formed a theme in the methodological backdrop to the research strategy were to be achieved.

5. A region that was easily accessible from Glasgow for fieldwork purposes. The fieldwork mainly took the form of a preliminary assessment of monuments and landscapes. The preliminary assessment was crucial in allowing the visualisation of landscape forms to be interpreted on more than a two-dimensional map-based level.

1.9 Concluding Comments

The development of a comprehensive theoretical and methodological theory is the essential base for not only this chapter, but for this research programme as a whole. It is quite clear that a localised understanding of the details of the mechanisms of change is essential, together with a wider contextual analysis to effect a clear and considered structured history - a historically-specific archaeology of human action in rural south-west Scotland during the post-Medieval and early industrial periods. This can only be attained by the integration of techniques from other disciplines, in particular the use of landscape studies, as a vehicle for this programme of research. It is also necessary to formulate the intellectual workload within the closed parameters, and research criteria, that allow a layered interpretation of the archaeology to be executed. The techniques and criteria discussed above will be implemented to allow the complexity and mass of information present within historic landscapes to be fully understood.

Chapter 2

A social and economic history of Ayrshire, 1600-1870

2.1 Introduction

This chapter deals specifically with the major period of change in the rural landscapes of Ayrshire from the end of the late Medieval period up to the beginning of the second phase of industrialisation of the county. It is the intention here to examine the historical development of the county in the period 1600-1870. This is the period which is characterised by the change in landlord-tenant relations and a move away from the feudal agricultural systems of the late Medieval period. It is postulated that this change in social relations is reflected not only in the agrarian landscapes of Ayrshire but can also be seen reflected via the development of craft and trade structures within certain parishes in the county. The key to understanding the changes witnessed from 1750 onwards lies within the social and cultural fabric of the county in the one and a half centuries preceding the onset of change. Consequently this chapter will aim to review Ayrshire's society from the late sixteenth century through to the major phase of industrial development in the county by looking at how pre-industrial crafts and early modern agriculture played an important role in establishing new Capitalist economies.

2.2 Ayrshire in the late sixteenth century; the social context

Ayrshire in the late Medieval period was essentially an agrarian feudal society based on landownership and power held by the secular elites and the church. "Possession of the land and the use of its produce under-pinned almost all organised activity" (Sanderson 1987, 299). To understand the context of the county prior to 1600 it is

essential that the role of both power centres is understood. The secular landholding elite directed power over their tenantry in many ways, Smout has characterised this as 'absolute power' and has indicated the extent of that domination:

> "Scottish landowners were the most absolute in Britain: as landlords, they operated in a country where small holders were hardly known and tenants had the very minimum of security; as heritors, they controlled poor relief, parish education and church patronage; as justices they regulated wage-rates and commandeered labour for the roads; as barons until late in the eighteenth century they sat in judgement over their own tenants in the barony courts" (Smout 1964, 218)

As mentioned in chapter 1 above the county was divided into three bailiwicks or districts; Cunninghame, Kyle and Carrick, which formed the nucleus of secular power. As in the later period power was focused through a number of key family elites, for example the Kennedy's, Earls of Cassilis, in Carrick, who had established themselves in the twelfth century, "acquired lordships in the fifteenth century, and earldoms in the sixteenth century" (Strawhorn 1982, ix). Like the Earls of Cassilis, the Montgomeries in Cunningham had followed a similar path, becoming the Earls of Eglinton in the sixteenth century. By the 1790s the absolute power of the Ayrshire landed families had led to the establishment of ten earldoms in the county, although in the case of three of them these were in fact later additions; the Cochranes of Dundonald, and the Dalrymples of Stair were not established until the seventeenth century, while the Boyles of Kelburn (Earls of Glasgow) took until 1703 to find their

power base. The only major family to lose power were the Boyds, Earls of Kilmarnock who had obtained a lordship in the fifteenth century and whose earldom was extinguished in the mid-eighteenth century due to the 4th Earl's support of the Jacobite cause.

In many senses the power exerted by the church was equally strong prior to the Reformation, they held substantial lands in the county and were able to exact many services from their tenantry. *The Mauchline Accounts Books of Melrose Abbey* (Sanderson 1975) are the classic example of religious authority controlling tenantry by means of in-kind services in lieu of rent. Although the parochial system differed in extent during the Medieval period it effectively conformed to the later distribution (see fig 2.1 - parish distribution c. 1795) and as Sanderson has suggested:

> "the distribution of the 43 parish kirks reflected that of population, being mostly concentrated in southern Cunninghame and northern Kyle, nearer to the coast and its immediate fertile hinterland than the upland regions of the eastern part of the Sheriffdom" (1987, 307).

For the tenantry the only perceived difference between secular and ecclesiastical power during the period was the control over military service, which was a sole feature of landlord power (cf. Sanderson 1975, 88): a feature which was clearly dwindling by the end of the sixteenth century.

Economically Ayrshire was a relatively self-sufficient society, it had few consumer production requirements and the distribution of early burghs suggests few inland market towns, the majority being located within the higher quality coastal-arable zone.

Ayrshire Parishes

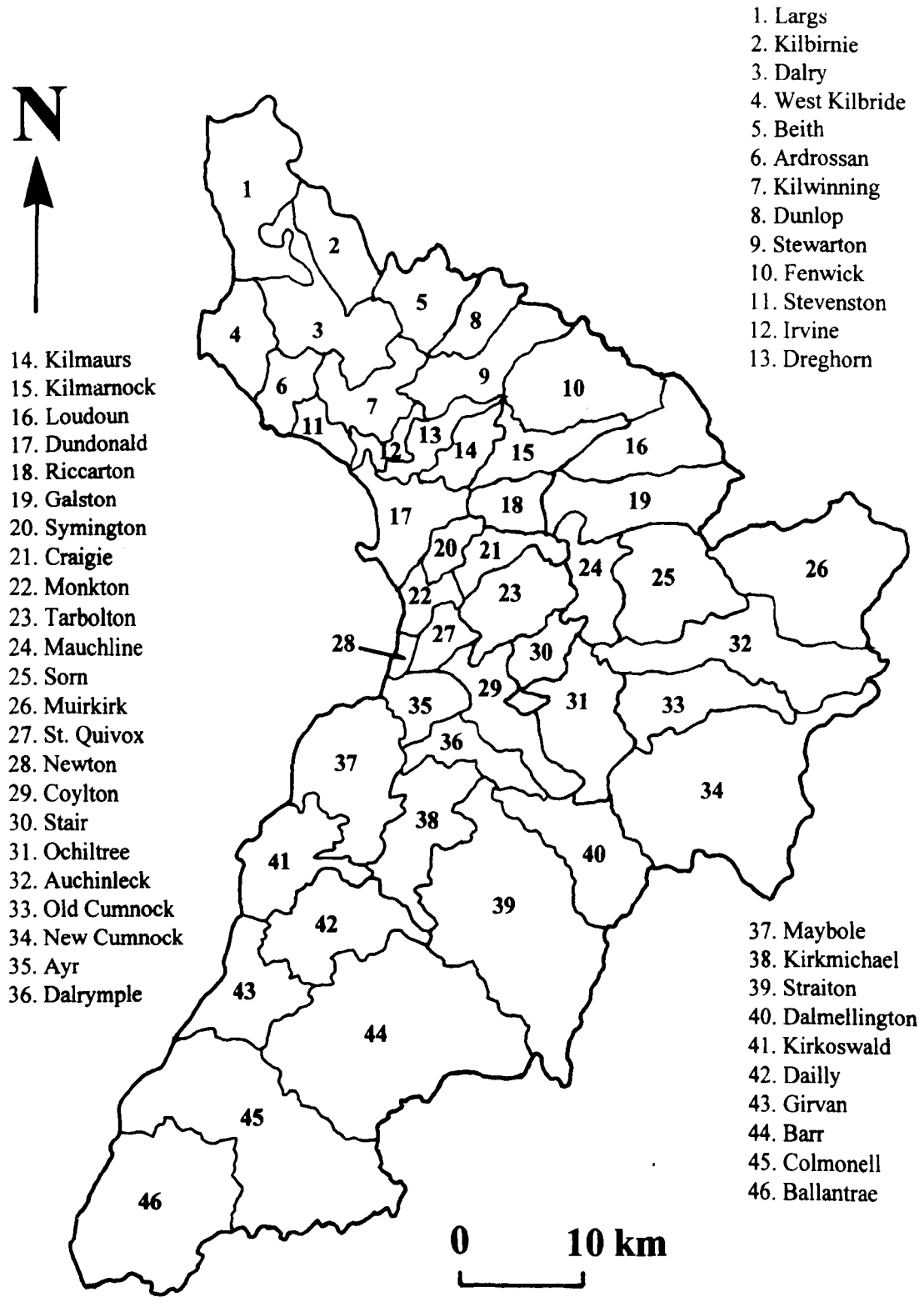

Figure 2.1 Distribution map of Ayrshire parishes

The establishment of burghs and their growth as market centres in the late Medieval period led to the centralisation of early trades within the rural landscape. Prior to this crafts were widely dispersed throughout the countryside, the transition to centralised burghs and towns of rural trades is the quintessential success story of early commercial activity in Scotland. There is some evidence of industrial exploitation in this period to support agrarian activity outwith the burghs. The Mauchline Accounts make considerable reference to the working of lime for use in the fields of the abbey lands (see Sanderson 1975, 102-103). This is an important feature which will be pursued further in chapter 6. There is also reference to the hewing of coal for local use within the abbey lands and more importantly for export. The late sixteenth century *coquet book* for the burgh of Ayr indicates "exports of coal through Ayr were substantial though irregular" (Mackenzie 1988, 8), and also includes fairly substantial exports of hides and cloth. The central developments clearly occurred within burghs and towns, not within the rural landscape. This is reflected in the changes which began to characterise the county's growth in the late Medieval and early modern periods.

Landlords were establishing burghs of barony "between the middle of the fifteenth century and the end of the seventeenth century" (Smout 1970, 73) in an attempt to centralise commercial activities. The classic example is the Earl of Glencairn who established Kilmaurs as a burgh of barony in 1527 by compelling "the small-holders to live together in the village centre with all the craftsmen and merchants found within the burgh" (McNaught 1912, 322-3).

For the majority of the tenantry the working of the land was their sole occupation, though the development of rural crafts was undoubtedly a feature of that work regime. This was both a seasonal and temporal part of Medieval agriculture in Scotland; seasonal in the sense that milling and processing of agricultural produce could only occur at specific times in the agricultural cycle, and temporal in the sense that evenings and days when no work could be completed in the fields were times when spinning and carding of yarn for example could be undertaken. Interestingly Colonel William Fullarton confirms this in a lengthy passage where he describes how:

> "Every farmer sowed a sufficiency of flax to employ the woman of his family at leisure hours. A small portion of hemp was likewise planted to make socks and other coarse materials needed on the farm. And a quantity of wool was either bought or reared for the purpose of spinning woollen stuffs to cloath the family. These, as well as the linen were usually worked by some weaver in the neighbourhood, and supplied the dress of both sexes" (Fullarton 1793, 8-11).

The integration of cottage industry with the agricultural regime was a consistent feature of rural life well into the early modern period. By the end of the sixteenth century changes in economy, and by extension social conditions, were underway in some sectors. The role of commercial interests was being catered for at an increasing level, whilst traditional landed power remained a consistent feature in the county.

2.3 The development of proto-industries ?: crafts and trades of Ayrshire, 1600-1750

> "Scotland was an economy where at least eight out of ten of the population lived and worked in a rural setting. The overwhelming majority in the society were food producers as well as food consumers" (Devine 1994, 4).

During the seventeenth century Ayrshire was little different to the general position outlined above, the majority of the county's population lived and worked within agricultural regimes. However this did not apply in totality, the development of trade and craft structures within Ayrshire burghs was arguably an important factor in the main phase of industrial expansion in the mid-eighteenth century. Economic historians, particularly in America and Scandinavia have discussed this as proto-industrialisation. Prior to discussing the developments in Ayrshire it is crucial to ask the question:

Did proto-industrialisation occur in Ayrshire in the early modern period ?

The term proto-industrialisation was first coined by Frederick Mendels in 1971 as having three main conditions:

> "Firstly, in order to differentiate it from local handywork and crafts within the agricultural community, it must be aimed at producing goods intended for sale in markets outside the producer's own region. Secondly, the labour force must

consist mainly of farmers and workers who alternate during the year between farmwork and work within the proto-industry. Thirdly, in certain regions, proto-industry depends on the expansion of a commercial agriculture" (Isàcson & Magnusson 1987, 9).

Dodgshon has commented that "by its very nature, the growth of domestic industry is not easily researched" (1981, 226). This is undoubtedly true, and while a substantial body of work has been undertaken in England with regard to the early development of crafts and trades in the rural landscape, little comparable work has been undertaken in Scotland (cf. Whyte 1983, 129). The lack of good quality general records for the early modern period in Scotland is clearly the main problem here. Those general records which do exist tend to be chance sources, for example the Poll Tax records of 1696, but their quality and geographical coverage is limited. Research into the organisation of domestic industries in Tudor England has indicated that "concentration of rural domestic industry appeared in areas of densely-populated pastoralism which were not well placed for cereal growing" (Jones 1974, 131). This has also been supported by the work of Thirsk (1966) who categorised the strongest growth as occurring in 'livestock-woodland type' areas. In Scotland, little comparable work has been produced, though Whyte's analysis of the *List of Pollable Persons in the Shire of Aberdeen* has indicated a similar pattern by the end of seventeenth century in the northern lowlands. He comments that "parishes in the predominantly arable Garioch had lower levels of recorded industrial employment" (Whyte 1983, 129) in comparison to pastoral areas such as Buchan where the incidence was higher. The Poll Tax records for Ayrshire would have provided an excellent comparison with this data,

unfortunately they are not as qualitative as the Aberdeenshire returns (cf. Whyte 1980, 122). For Ayrshire there are no detailed sources available for general distribution of industry in the county during the seventeenth century, so a modified approach has had to be developed. This approach has utilised the indexes for the *Register of Sasines* to give some indication of the spread of rural industry in the county. There are of course problems in utilising such a source, for starters it does not give complete coverage of all individuals who worked at given trades in the period: it only covers those individuals who acquired or sold land. It is also limited in the sense that it will only reflect - in general - those individuals who worked at a craft as a sole occupation, though a few examples of portioners who also specified a trade were apparent. Having said that, it is postulated that it should in theory still reflect differences in regional, that is arable or pastoral area, distribution by parish. Theoretically, the incidence of land acquisition or sale should reflect the successfulness of particular trades in the county, and by extension the relationship between successful trades should be visible in distribution against quality of land. In order to reflect changes through time it was the intention to examine the indexes for four periods: 1600-1610; 1650-1660; 1700-1710; and 1750-1760. During the examination a major problem was encountered within the sources. Although county indexes were available for the two seventeenth century periods, for the two eighteenth century periods this was not the case, though the period 1701-1720 was available as a nation-wide index. The later period however, was not available in any easily accessible form, only general indexes exist for the rest of the eighteenth century. These general indexes do not specify name, occupation or place, and are therefore of little use for this type of analysis. In order to have some form of statistical information for the period 1750-1760 an alternative source was

essential. The index for the *Commissariat of Glasgow* was chosen as a comparable source for this work, though it too suffers from similar problems. In particular it only reflects those individuals who left an inventory of their goods when they died, which in general means those individuals who had something to leave in the first place. This means that it will only reflect - in general - the tradesmen who were relatively successful and by extension will give a limited idea of the numbers of tradesmen or crafts working in Ayrshire for the period.

The compiling of the data from the indexes of the *Register of Sasines* (see appendices 1-3) and the *Commissariat of Glasgow* (see appendix 4) was undertaken so that a diagrammatic representation of occupation against parish could be developed (see figs 2.2, 2.3, 2.4). There was no intention of drawing comparisons between numbers of given trades noted in the indexes as somehow reflective of actual numbers working in the county. It had been assumed that the numbers of entries would increase exponentially through time, in other words it was deemed likely that the numbers of entries in the indexes of the *Register of Sasines* for tradesmen would increase dramatically between the seventeenth and eighteenth centuries as the quantity of the records increased over the period. This however, did not prove to be the case. Although the number of entries increased between 1600-1610 and 1650-1660, from 46 to 99 recorded entries, in the period 1700-1710 there was only one recorded entry in the index of the *Register of Sasines*. This was initially interpreted as a problem inherent in this form of index, however closer inspection revealed trades in other counties. In order to confirm this result the same period was examined via the index of the *Commissariat of Glasgow* which mirrored the same lack of entries with only one

noted. This is further supported by the index of the *Commissariat of Glasgow* in the period 1750-1760 which had 34 entries for tradesmen.

Parish Trades, 1600-1610

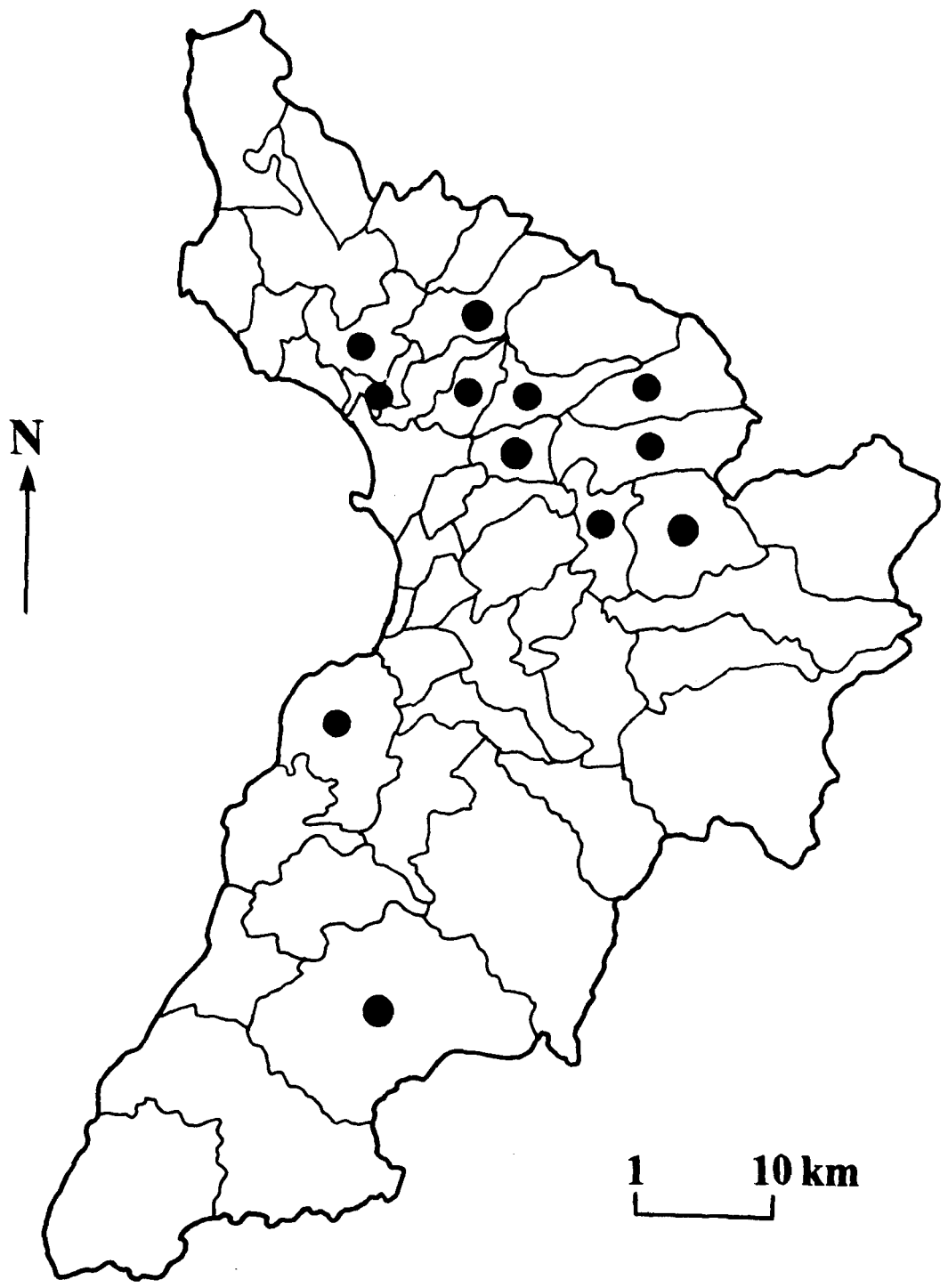

Figure 2.2 Location of trades against parishes in Ayrshire, 1600-1610

Parish Trades, 1650-1660

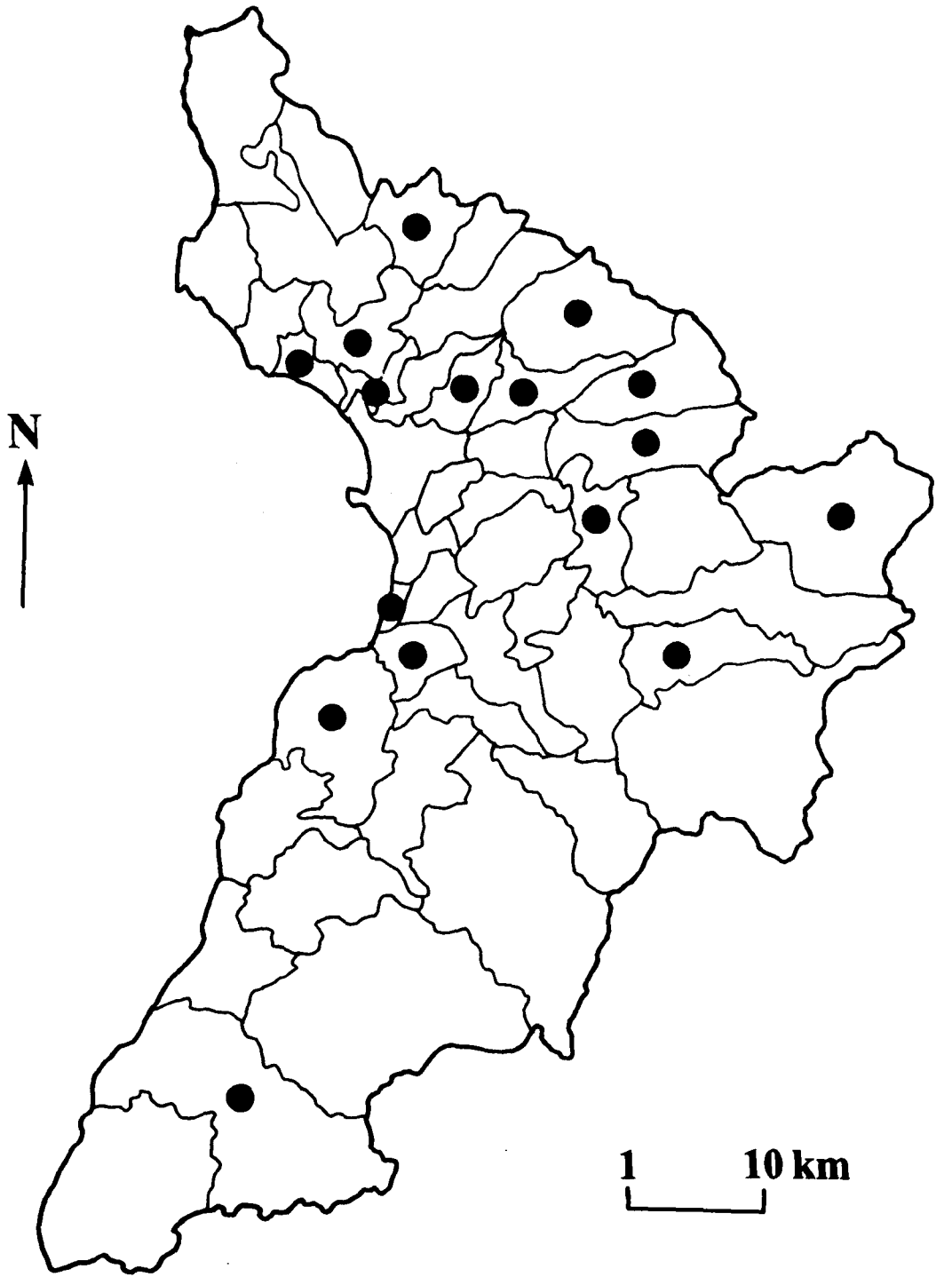

Figure 2.3 Location of trades against parishes in Ayrshire, 1650-1660

Parish Trades, 1750-1760

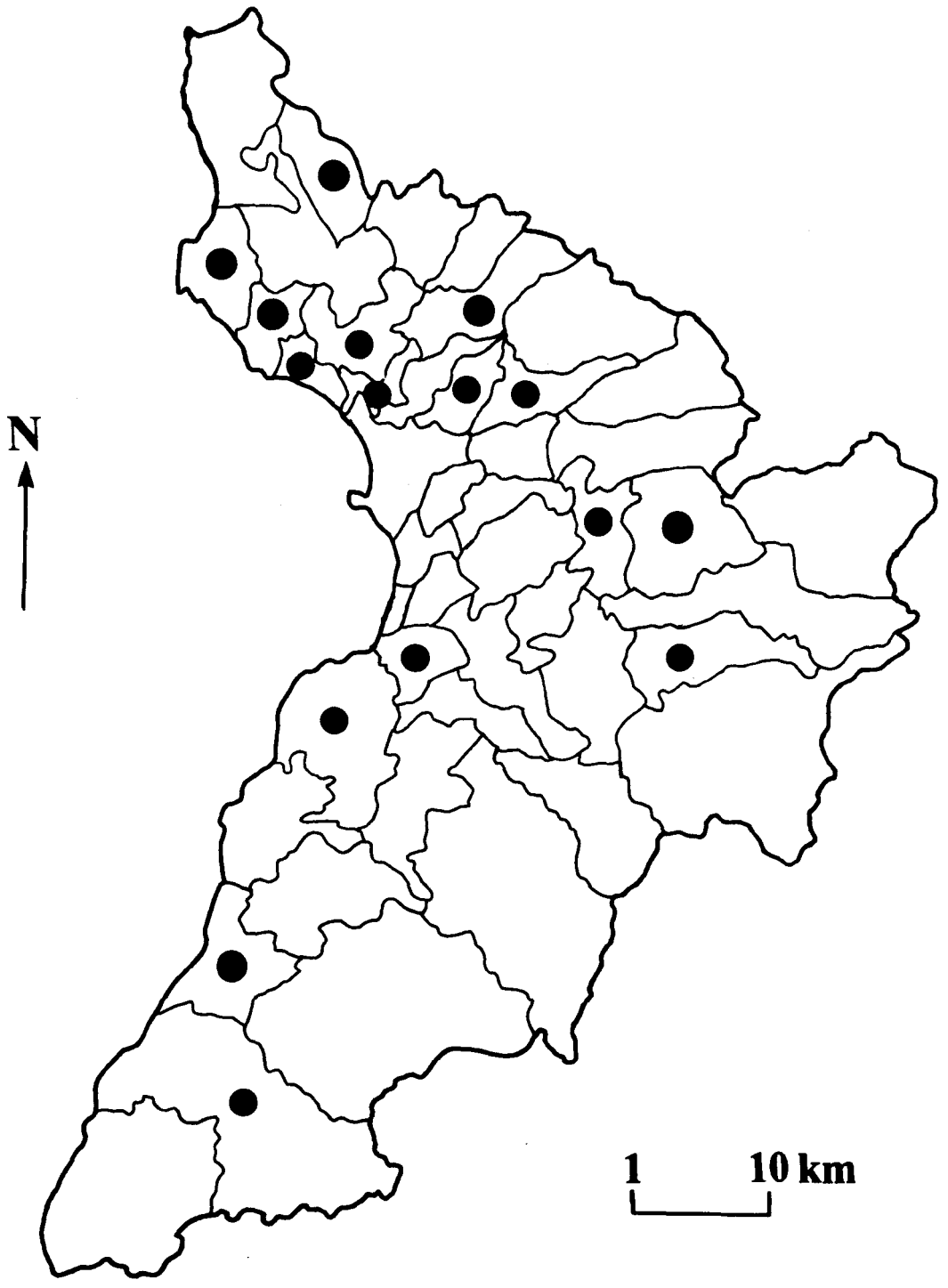

Figure 2.4 Location of trades against parishes in Ayrshire, 1750-1760

There is no clear reason for such a discrepancy to occur within the data. Whether it actually reflects a social change in the position of trades or crafts during the early seventeenth century is not directly inferable from this sort of analysis. If it does reflect a social change, then it has not appeared in historical writing on this period as yet.

To get back to the main purpose of the analysis, the results make for interesting reading, and have been presented as three illustrations depicting trades/crafts by parish (see figs 2.2, 2.3, 2.4 and 2.1 for cross-reference of parish names). The analysis of trade/craft distribution has also been matched against land quality. Land quality for the purposes of this work has been assessed as three main groups based upon the characterisation of modern land use developed by The Soil Survey of Scotland (Bibby 1982). High quality land is denoted here as land capable of producing a wide to very wide range of crops, whereas medium quality land is land capable of producing a narrow to moderate range of crops, and finally low quality land is land capable of use as improved grassland or rough grazing. In the case of the 1600-1610 index (SRO index no 23, 1599-1609) distribution revealed 12 parishes where trades were successfully operating (fig 2.2). Of that 12, no single parish was solely within the high quality land zone, though in the case of Irvine, Kilmaurs, Riccarton and Maybole limited amounts of high quality land were available in the parish. In the case of the other eight parishes, four lie solely within the medium quality land zone (Kilwinning, Stewarton, Kilmarnock and Mauchline) and four lie partially within the medium and partially within the low quality land zone (Loudoun, Galston, Sorn and Barr) (figs 2.1 and 2.2). The data from the period 1650-1660 (SRO index no 31, 1535-1660) tends to support the relationship between medium quality land and the distribution of trades

(see fig 2.3), however for the first time two parishes which are principally within the high quality arable zone register trades (Ayr and Newton). The reason for this may however be more related to the expansion of the burgh of Ayr, which "continued to make progress" during the seventeenth century (Strawhorn 1989, 70). Strawhorn's analysis of the *stent rolls* indicates that that progress was tempered in relation to other royal burghs throughout the period: "In the sixteenth century Ayr stood as....8th (1597); in the seventeenth century Ayr's position had dropped to 13th (1649)" (1989, 70). Having said that, the burgh clearly expanded in trading terms between the beginning of the century and the 1650s. Once again a number of parishes (Stevenston, Irvine, Kilmaurs, Kilmarnock and Maybole) registered trade activity and had small proportions of high quality land within their boundaries, whilst only 3 out of 16 parishes were solely within the medium quality land zone (Beith, Kilwinning and Mauchline). The remaining six parishes (Muirkirk, Colmonell, Fenwick, Loudoun, Galston and Old Cumnock) were located on land which was both medium quality and low quality in nature (figs 2.1 and 2.3). By the mid-eighteenth century that distribution appears to be very similar (see fig 2.4), with only Ayr registering trades within the predominately high quality land zone. Of the other 14 parishes, 4 appear in the medium quality land zone with small amounts of high quality land available (Maybole, Kilmaurs, Kilmarnock and Irvine). In the medium quality land zone 5 parishes are solely present (West Kilbride, Mauchline, Kilwinning, Ardrossan and Girvan), with 5 others with varying amounts of low quality land present (Stewarton, Sorn, Old Cumnock, Colmonell and Kilbirnie) (figs 2.1 and 2.4). In the broadest of terms the period 1600-1760 is characterised by a fairly even distribution of successful trades, with a clear correlation between trades and parishes where medium quality

land is predominant. This would appear to confirm the Aberdeenshire Poll Tax returns, though Thirsk's assessment (1966) of land quality where trades flourished - in livestock/woodland areas - may not be entirely the case in Ayrshire. The concentration of successful trades in northern Ayrshire to the detriment of most of Carrick and the east of the county is difficult to explain in a theory where pastoral areas are most likely to have the majority of tradesmen present. Devine has suggested that "many cottars were also tradesmen, weavers, carpenters, blacksmiths and other artisans who depended on the small holding for subsistence and who had a house and a yard in the toun" (1994, 13). In chapter 5 an assessment of the form of settlement in Carrick concludes that a substantial proportion of the archaeological remains of this period are in fact cottars' houses. If these small domestic trades and crafts are effectively hidden from the data set then in reality what does the distribution witnessed within the indexes of the *Register of Sasines* and the *Commissariat of Glasgow* represent ?

In order to consider this more fully it is important to examine the numbers and types of trades involved within the parishes. It is quite clear from the data that concentrations of successful trades occur within burghs and not within fermtouns. The data for 1600-1610 indicates 30 of the 46 entries as located within five main centres of activity (see fig 2.5 below):

Parish	*Burgh*	*No. of entries*	*No. of trades*	*No. in burgh*
Irvine	Irvine	5	5	5
Kilmaurs	Kilmaurs	5	2	4
Kilwinning	Kilwinning	14	9	8
Loudoun	Newmills	6	5	5
Maybole	Maybole	9	6	8

With the exception of Irvine and Kilwinning which were royal and older burghs respectively the others were created as burghs of barony between 1491 and 1527. Although Kilwinning and Maybole were clearly the most successful of this group in terms of the numbers of tradesmen within the burghs acquiring or selling land, it is Kilmaurs which is the most interesting. In Kilmaurs parish the inter-related trades of tanning and shoemaking (cordiners) dominate the entries. All the other burghs show little specialisation, though in Maybole three tailors were present between 1602-3. The data from the 1650-1660 indexes also suggests a close parallel between the distribution of burghs and a wealthy class of tradesmen, with 70 out of 99 entries located within 6 main burgh centres (see fig 2.6 below):

Parish	*Burgh*	*No. of entries*	*No. of trades*	*No. in burgh*
Ayr	Ayr	12	8	12
Irvine	Irvine	6	2	5
Kilmaurs	Kilmaurs	14	4	11
Kilwinning	Kilwinning	10	5	3
Loudoun	Newmills	21	8	21
Maybole	Maybole	19	8	18

Examination of the index this time reveals specialist concentrations in Irvine (coopers and tanners) and a confirmation of the suspected specialism within the 1600-1610 indexes of cordiners (shoemakers) in Kilmaurs burgh: 9 out of the 11 entries were for shoemakers. There may well have been a secondary specialist industry in this parish with 3 cutlers apparent, 2 of which were operating from within the burgh. In Newmilns specialism in shoemaking and in the cloth industries was also apparent. Of the 21 entries for the burgh 8 are related to shoemaking and 11 are related to the manufacture of cloth and its production into garments (4 fullers, 2 wobsters, 1 walker, 1 weaver and 3 tailors). In Maybole, the existence of a specialist community producing garments (see above) seems to be confirmed by the existence of 6 tailors and 4 wobsters in the burgh. The evidence from the parish of Kilwinning once again shows a relatively high proportion of trades operating outwith the bounds of the burgh, though even here specialisation in shoemaking outwith the burgh in the townships of Byres of Kilwinning and Easter Bridgend was apparent. The only burgh

to indicate low incidence of specialised groupings of trades was Ayr which had 8 trades out of 12 entries within the town. The question of reliability of the data is clearly important here. Although the data suggests growth of specialised industries within the burghs how reliable is this information ?

Even though the numbers involved are relatively small, it would seem an exceptional coincidence if the Kilmaurs figures were achieved by chance. The fact that growth and ultimately success of commercial industries like shoe production or cloth manufacture and production can be identified during the early to mid-seventeenth century in the county would seem to cast doubt on Lebon's assertion that "industry was essentially small-scale and widely diffused" (1933, 167). This assessment has indicated that distribution of successful trades in post-Medieval Ayrshire reflects the beginnings of commercialised production in the county, which was clearly focused through the royal and baronial burghs. Although the distribution reflected within the two documentary sources consulted clearly reflects the upper end of trades and crafts for the county, and distribution of rural support industries was undoubtedly more endemic throughout the county, it does help in the assessment of seventeenth century industrial developments.

With regard to the above questions which have been posed, the evidence from the analysis of the *Register of Sasines* and the *Commissariat of Glasgow* would appear to suggest three key things:

1) The general distribution of trades against parishes, over a 150 year timespan, implies a continuity of growth within northern Kyle and southern Cunningham.

2) The role of burgh centres, particularly burghs of barony in that growth is critical in understanding the development of not only trade structures in Ayrshire, but also landlord power in the period.

3) The clear specialisation witnessed within particular burghs of particular trades implies that the hitherto received position that Ayrshire prior to 1700 had no formal industries is too simple a supposition.

Having reviewed the position it is now important to answer the initial question with regard to the proto-industrialisation of Ayrshire. With regard to Mendels initial definition of proto-industrialisation, the data recoverable from the resources examined for post-Medieval Ayrshire does not fulfil the criteria specified. However it is also redolently clear that Mendel's criteria have been consistently criticised as too uniform (Hudson 1981 37; Isacson & Magnusson 1987, 11). The development of trade structures within burghs was an important feature of the pre-industrialisation of Scotland. Although this is not technically proto-industrialisation it must be understood that the Industrial Revolution was "a process of gradual change with many sources, and relying on different technologies and forms of organisation" (Isacson & Magnusson 1987, 2). The route to industrialisation in Ayrshire was not simply a matter of landlord or entrepreneurial investment within agricultural communities, the

social path had already been paved within communities where commercial production was already a feature of life.

2.4 Transformations in the agrarian landscape up to 1870

Much of the discussion with regard to early modern agriculture has revolved around the question of continuity or change in agricultural society during the seventeenth century and early eighteenth century. It is not the intention to deal with this debate here as it is developed further in chapter 4. This section will instead concern itself with the social character of agricultural communities and investigate whether changes were apparent in the period up to 1870. "The Scottish rural landscape was essentially modified by two forces: technical changes (for example enclosure, new crops and rotations) and organisational changes" (Whyte 1980, 117). Devine has recently argued (1994) that although structural (i.e. technical) change in agriculture did not occur until the mid-eighteenth century, a social (i.e. organisational) change had been initiated much earlier. By analysing tenancy agreements in Ayrshire Devine was able to conclude that "the period from 1700 to the 1750s can be regarded as one of ongoing change in tenure and tenant structure" (1994, 21). This is not a new view, Whyte as early as 1980 had concluded that organisational transition in lease arrangements was clearly underway by the seventeenth century in the Scottish lowlands (Whyte 1980). This transition in lease arrangements is reflected in the differences apparent between single and multiple tenancies during the period 1670 to 1770, for example on the Earl of Glasgow's estate in 1761 only 4% were multiple tenancies, while 96% were single tenancies by that time: a fact which is also reflected on the Earl of Eglinton's estate

during the same period. This is also a feature supported by Whyte who indicates that on the Cassilis estates "rentals indicate that the proportion of tenants with written leases increased between the 1620s and the 1650s" (1980, 127). This conflicts with the traditional view which saw tenants holding short term verbal leases (Handley 1953; Smout 1969). The transition in organisational structure from verbal leases and multiple tenancies of the late Medieval period to written leases and single tenancies evolved over time and was still occurring on many estates after the Improvements had already started in Ayrshire. The example of Carngillan township on the Eglinton estate which was held by 8 tenants in 1747 and was gradually reduced to a single tenancy farm by 1815 is evidence of that. Although the picture is a complicated one for Ayrshire and the lowland Scotland in general it is clear that "the rise of an independent farming class, controlling its own land with the security of a long lease, was already advanced by 1750" (Devine 1994, 29). This of course had the side effect of releasing substantial numbers of the workforce who were no longer firmly tied to the land in the way they had been within the multiple tenancy system. "Small-scale tenants, cottars and labourers, displaced from the land by Improvements, provided a pool of labour which could be drawn upon for unskilled and semi-skilled work" (Shaw 1980, 312).

The second major change to occur in the agricultural sector was born out of the organisational or social changes discussed above. It has been suggested that the technical or structural change to the landscape and the introduction of enclosure, new crops and rotations occurred during the second half of the eighteenth century (e.g. Caird 1964; Turnock 1982). Devine however has codified this, suggesting that the

changes were most radical during the period 1760s-1770s with 68% of *Old Statistical Account* (OSA) returns indicating this period as the crucial time (1994, 43). What is clear is that the Improvement movement was well advanced by 1800 and had at its foundation increases in productivity and formal changes to the character of its landscapes. Those formal changes, in particular the alteration of field structure, agricultural practice and the form of steadings have been well charted in the recent past (e.g. Parry & Slater 1980; Fenton & Walker 1985; Devine 1994), however some of the more fundamental changes have tended to remain as footnotes to the historical development of lowland Scotland. The integration of industrial expertise within agricultural regimes has tended to be overshadowed by the developments of large-scale industrialisation. The expansion in the lime industry from 1760 onwards and the development of drainage tiles in Ayrshire during the 1830s were fundamental aspects of the technical shift required to expand production from the agricultural zone. The development of a road infrastructure by the passing of the 1767 and 1784 Ayrshire Road Acts (McClure 1994) permitted these expansions access to markets throughout the county. Ancillary industries were also initiated and included works to produce large quantities of spades for use in drainage programmes and within the new field systems, for example the Treavoch Spade Works on the Ayr Water set up by Lord Cathcart (Smith 1895, 140). Although the development of the brick and tile industry has been recently assessed (see Oglethorpe & Douglas, 1993), the early industry prior to 1850 still remains elusive. Drainage tiles were introduced around 1826 by the Duke of Portland and expanded quickly as an estate-based industry which by 1838 had quickly established itself as a major component of the agricultural scene, so much so, that the Ayr Observer reported that tileworks 'have risen up like mushrooms in every

quarter'. A further catalyst for the expansion of tileworks was the removal of the tile tax in 1939, legislation allowing landowners to raise capital for land improvement in 1840 and Peel's Land Drainage Act of 1846 (Fenton 1976). The expansion of estate-based industries specifically designed to facilitate the transformation in the rural landscape of Ayrshire played a crucial role in the developments of the period. The tileworks founded to produce tiles for the drainage of larger estates soon became a consumer industry of their own, likewise lime production followed suit and even managed to penetrate the pastoral economy as is indicated by the Old Statistical Account returns for the South Carrick parishes.

The development of Capitalist industries during the same period is discussed below, however in order to appreciate the inter-relatedness of both forms of production and the global effect that they had on the communities of Ayrshire it is important to discuss the demographic changes which occurred during the period. During the period 1790 to 1840 the population of the county almost doubled from 75,000 to 164,000 (Strawhorn 1969, 9-43). This, together with the structural and organisational changes to the rural community, the development of new consumer-led industries, the urbanisation of towns like Paisley and Glasgow and the development of better communication links, established a new form of social unit within the county. Although urbanisation occurred particularly in the northern parishes of Ayrshire it was never as marked as north Lanarkshire. Even in the most marked cases like Kilmarnock, the agricultural base of the community remained intact. Although both Lebon (1959) and Devine (1994) have commented on the shift in population from the rural south to the industrialised north, the population increases tended to be spread out

over large areas and not centralised around developing towns (cf. Campbell 1991, 27). Pastoralism remained dominant within the south, while arable and dairy became the success story of central Ayrshire. Up to 1870, industry never took hold in south or central Ayrshire, with the exception of the agricultural service sector. The industrial developments in much of the county remained on the periphery of the agricultural belt.

2.5 The Industrial Revolution up to 1870

In chapter 3 the distinction between industries utilised by individual fermtouns, or organised on an estate level to service a number of fermtouns, from large scale industrial exploitation aimed at generating financial gain in the market place will be developed. That is, there is a difference in purpose, size and reason which divides the two forms of industrial activity. "Industry was an established if unobtrusive part of the Scottish landscape long before its rapid advance during the closing decades of the eighteenth century" (Donnachie 1994, 43-44). This is a chronological and developmental difference, large scale extractive and processing industries may even have existed in substantial numbers prior to the early industrial phase, 1750-80 (Gordon 1983), though they operated on a much smaller scale. In Ayrshire for example extraction of coal on a large-scale had been established by 1678 by Robert Cunninghame of Auchenharvie (Strawhorn 1982; 1996; Whatley 1975). The pedigree of many large-scale industries is inextricably linked to their small-scale rural ancestors, with iron and steel production developing from bloomery iron production being the classic example. The coming of the early stages of industrial development

meant a spiralling of entrepreneurial interest, and consequently production in some industries, whilst others remained as purely rural or service-based in focus. The centralisation of entrepreneurial industries, particularly those which could be focused in a number of large centres (iron, cotton, mining, brewing) took off, leaving the service industries widely dispersed, and relatively under-developed. The work of the smiths, millers, wrights, etc., was central to the operation of the rural economy, consequently they remained scattered throughout the rural landscape, operating on a relatively small-scale. The principal example of the need to retain service industries on a local small-scale basis are corn mills. "The cultivation of grain in Scotland, as elsewhere, has always been closely associated with the techniques of threshing and milling" (Hay & Stell 1986, 1) which in turn meant that in an age when transportation was still limited by topography and the lack of a well defined road system the need for local milling services was still at a premium. It also made sense for estates to remain in control of their own service industries which brought income into them, whereas developments in the iron making and production process related to superior quality goods, particularly after the establishment of the Carron ironworks in 1759, meant that bloomery iron production on the small local-scale was no longer a viable proposition. Smout confirms this by analysing entrepreneurial investment in conjunction with landlord interest in the Ayrshire cotton industry of the eighteenth century. It is clear that initially interest was high with examples such as "Catrine Mills founded by Dale with Alexander of Ballochmyle" (Smout 1964, 227) evident. However by 1830 very few landlords became involved in the iron industry: "only Cunninghame of Craigends of the distinguished Ayrshire firm of Merry and Cunninghame appears to have deliberately fostered the iron industry" (Smout 1964,

228). Landlord interest was clearly limited to the exploitation of personal estates, rather than an interest in industrial development within the country as a whole. Arguably, the distribution of industry in the period 1750-1800 was related to landlord interest in textiles, whereas after this period it had more to do with entrepreneurial interest in raw materials for production. Smout summarises his position by claiming that:

> "What the landlord valued above all other attributes of his position was not his comfortable income but his sense of power, and it followed from this that he was interested in national economic development only in so far as it strengthened his paternal standing in the local community. Applied to industry, this meant that he limited his enthusiasm to rural industries, which fascinated him by their ability to provide rent and accommodation. Thus coal-mining, lead-mining, salt-panning, limeburning....being essentially rural throughout the period, held the landlord's attention throughout" (1964, 231).

There are two clear criticisms of this view, particularly in relation to Ayrshire in the eighteenth century. Primarily the social control of tenantry, although still a major feature of landlord power during the period, was no longer the key issue. The second half of the seventeenth century had seen the demise of Feudalism in the lowland landscapes of Scotland "land was increasingly seen by many as an asset to be exploited rather than simply the basis of personal authority and family power" (Devine 1994, 1). Secondly, although exploitation of salt-panning occurred in the Auchenharvie estate during the eighteenth century (see Strawthorn 1996), this was

limited in comparison to the Forth basin where it was clearly a major industry. In the case of Ayrshire lead mining was not a real issue. The other two rural industries mentioned, coal-mining and limeburning were heavily exploited, however it is the reason for their exploitation which is the key issue. Coal-mining and limeburning were inter-related industrial exploits during the Improvement period, as Strawhorn has suggested "it was incidental to agrarian improvements that the landowners became interested in their mineral resources" (Strawhorn 1958; 1982 xvii; also cf. Lebon 1933). The use of coal and lime by landlords had more to do with initiating growth in agricultural production rather than facilitating personal standing within the community, or for that matter generating rent or accommodation for their tenantry. The lime industry in Ayrshire was a critical factor within the rural economy prior to and during enclosure, its role was fundamental (see chapter 6 below).

Two clear types of industry are evident from the early industrial period onwards throughout the five stages of Rostow's model of industrialisation (1960). Much of the focus of historical commentators up until the 1970s was aimed at the large-scale industrialisation of Britain (Hamilton 1932; Rostow 1960; Campbell 1965). Even within the current literature there is little attempt to distinguish between the types of industrial activity practised in the rural landscape. Even the Whytes', who are normally reliable discussants of the Scottish landscape, fail miserably to identify the agricultural service industries in their recent book *The Changing Scottish Landscape, 1500-1800* (1991). Under a chapter entitled 'Industry in the landscape', brief histories of coal, salt, iron, mining, quarrying, textiles and the rise of cotton are presented. The only reference to what could constitute small-scale rural service industries is a sub-

chapter on lime-burning. Their interest is focused on the large-scale exploitation of industries, with only passing reference to small-scale usage (Whyte & Whyte 1991, 225). This is a problem which needs to be developed so that a proper understanding of the mechanics of industrial landscapes can be developed, therefore the distinction between rural service industries and large-scale 'Capitalist' industries needs to be separated so that the rural industries can have their place in agricultural growth (see chapter 3 for further discussion).

The first phase of industrial growth in Ayrshire, as elsewhere in Scotland, was characterised by the spread of textile mills, particularly linen, wool and more importantly cotton. By the 1790s they numbered seventeen in the county (figures derived from OSA, 1790-95), with distribution confined in the main to northern Kyle and southern Cunningham. The OSA also indicates substantial numbers of weavers of silk, cotton, linen and wool throughout the county, which Lebon has calculated as in excess of 2300 workers (1951; 1959, illus 5). The impact of such a social change was enormous, a fact which is supported by demographic trends for the period (see Devine 1994, table 7.13) which show massive changes in population within the county, with out-migration from the pastoral communities in the south, south-east and north of the county in excess of 30% of the known population between Webster's census of 1755 and the OSA returns of the 1790s. Although a direct correlation between the shift in population and the establishment of textile weaving and milling centres is not directly inferable from the data, the majority of parishes in northern and western Kyle, southern Cunningham and western Carrick indicate substantial rises in population over the period (see Lebon 1951; 1959, fig 7 for details). A clear feature of this period

of industrial growth was the establishment of new villages specifically founded as industrial centres. "The cotton industry introduced to Scotland one of the most dramatic elements of the Industrial revolution; large water-powered spinning mills with adjacent planned communities" (Whyte & Whyte 1991, 230). This is supported by Devines' analysis of the OSA data for the counties of Ayrshire, Dumfriesshire, Lanarkshire and Renfrewshire which has led him to conclude that "42% of the 183 parishes examined had such an industrial presence, usually indicated by a small town or village community" (1994, 45). In Ayrshire the establishment of villages such as Catrine or Muirkirk was directly related to industrial expansion in textiles and iron making. Though not all new 'industrial' villages had a direct effect in attracting population from outwith the parish. Dalgain (Sorn parish) for example was located next to the industrial settlement of Catrine and founded in 1781 by a Dr Stevenson of Glasgow (six years prior to Catrine). By the time of the Statistical Account there were 50 families living there amongst whom were "3 shopkeepers, 3 innkeepers, 3 masons, 7 shoemakers, 5 weavers, 5 tailors, 4 seamstresses, and 7 colliers; the rest were labourers, aged widows, etc." (OSA 1797, 533). It is clear from the comments of the minister at this time that most of the occupants had "formerly lived in cot-houses, which are now in ruins" (OSA 1797, 533) and came from within the parish. In other words the complexities of demographic changes in the period meant that for many removal from the land meant a new life in an adjoining village community rather than wholesale removal from their parish. This of course was very dependant on the location of the parish in question, whether any suitable industrial developments occurred to support an industrial community and whether transport improvements had provided suitable markets; however it is quite clear that:

> "To a significant extent, Scottish industrialisation to 1815 was primarily a rural phenomenon and this was reflected in the spread of industrial settlements....such settlements also grew as country craftsmen withdrew from the farming communities and landowners developed alternatives for small tenants and cottars" (Devine 1994, 40).

The rise and subsequent fall of the textile industries in Scotland, particularly the case of the cotton industry has formed a central theme in economic history in this country. It is not the intention to present the theories of development and failure here, this has been more than adequately covered by other authors (e.g. Campbell 1965; 1980; Slaven 1975; Lythe & Butt 1975). It is more important within this context to view the rise and fall of the textile industries after 1825 in relation to their effect on the social fabric of Ayrshire. The forces of urbanisation, agricultural improvement and mechanisation in industry clearly had a huge effect on the county's settlement pattern. The mechanisation, and consequential increases in production levels of spinning mills in the late eighteenth century led to a need for increased numbers of weavers, which in turn led to alterations in settlement form. Campbell summarises it as follows:

> "Consequently, numerous villages in Renfrewshire, Stirlingshire, Ayrshire and Lanarkshire, which until then had been only agricultural hamlets clustering round a parish church, began to acquire additional housing: cottages, sometimes of two storeys (or one and an attic), or sometimes with a common

close between them and a weaver's shed in the garden" (Campbell 1965 103-4).

By the 1860s the cotton industry had declined, though the effects on the social communities of the county were not as dramatic as they might have been in other circumstances. This was primarily due to the rise of heavy industry in the west of Scotland, in particular the rise of the iron industry. The late eighteenth century saw the beginnings of the central force behind industrial expansion in nineteenth century Ayrshire: the establishment of early ironworks in the eastern fringe of the county. Although an early attempt was made to extract hematite and process pig iron on the lands of Lord Cathcart in the 1730s, the ironworks known as Terreoch (Tarrioch) appears only to have functioned for a few years (Findlay 1980). "The extensive industrialisation of Muirkirk parish began with the British Tar Company, founded in 1786" (Hume & Butt 1966, 162). As a side effect of their production processes large quantities of coke became available which together with the mineral resources and reasonable communication links made Muirkirk an attractive prospect for iron production. Muirkirk was the first successful ironworks in Ayrshire; established in 1787 it functioned until closure in 1923. The location of Muirkirk and Glenbuck, the adjacent works which functioned from 1801 until 1813, are testament to entrepreneurial interests moving into an upland area of low population to exploit the mineral resources. The selection of Muirkirk was based more on available sources of ore, limestone and coal than workforce location. Donnachie and Butt confirm this by suggesting that "one of the initial problems was housing the labour-force" (1965, 217), a fact which is confirmed by the correspondence extant in the *Seaforth*

Muniments. The development of the iron industry in Ayrshire was dramatic to say the least; its effects on other industries, notably coal production, ironstone mining and lime quarrying were manifold. The position in relation to the coal industry is vivid in this respect, sales potential in coal was "limited to coastal and Irish markets until the age of the ironworks and improved internal transport" (Duckham 1970, 155). Whatley has confirmed this radical expansion by analysing consumption by blast furnaces in the county: "rising from around 36,000 tons of coal in 1830 to 900,000 tons in 1876" (1983, 51). Of course the expansions in iron production and its associated industries occurred because of investment throughout the county, total output of all Scottish pig-iron in 1825 stood at 25,000 tons, by 1840 that had spiralled to 240,000 tons. "In the period between 1825 and 1841 eleven new ironworks were opened in the west of Scotland; the hectic expansion continued unabated" (Slaven 1975, 118). The number of large-scale ironworks increased dramatically throughout the coal producing zone; by 1848 there were 5 works operational in Ayrshire with a further 17 under construction. Works such as Dalmellington, Lugar, Glengarnock, Blair and Muirkirk altered the face of the county's landscape and provided occupation opportunities well beyond the period of this doctoral work. Other centres for production were not as successful, furnaces were established at Cessnock and Dalry in the late 1830s and foundries operated in the larger diversified towns such as Ayr, Irvine and Kilmarnock alongside other industries.

One of the key factors in understanding the developments in Ayrshire during the early nineteenth century is the expansion in communication links which facilitated expansion in industrial developments to a considerable degree. "The more dramatic

improvements came with the turnpike roads. Ayrshire led the way in western Scotland with two general Turnpike Acts in 1766-7 and 1774" (Slaven 1975, 38). In many senses Ayrshire's modern road pattern was effectively laid out between 1780 and 1800. This allowed for development of many industries including coal and iron, and played no small part in the development of the counties industrial viability. It is also quite clear that the road schemes had an ulterior effect as well, they also acted as a lifeline for rural communities:

> "Rural Scotland depended on its roads for the movement of its lime, its manure and its coals, and all farm products flowed along local roads on to turnpikes and into the growing rural markets of the industrial towns" (Slaven 1975, 40).

In no small way, the development of road networks aided in the Improvement process within the agricultural zone, although other forms of communication links also played a significant role in opening up markets, both within and outwith the county. The development of canals in Ayrshire was limited and although leading landowners like the Earl of Eglinton participated in grand ventures such as the Ardrossan - Paisley - Glasgow Canal the venture was never completed. On a local scale though, the impact of developments such as the Stevenston to Saltcoats canal (1772-1830) did permit coal to be sent directly from the coalfields to the market place, where it could be exported to Ireland or form part of the coastal trade plying up and down the Clyde Estuary. Of much more importance was the development of rail links in the county; tramways and plateways were being utilised in Ayrshire from the late eighteenth

century, though the revolution in rail travel occurred slightly later, between 1825 and 1850. The key line in Ayrshire was undoubtedly the Glasgow, Paisley, Kilmarnock and Ayr line opened in 1840, this had the effect of opening up the mineral fields of north Ayrshire and "also became the focus for a number of Ayrshire's ironworks, notably Glengarnock, Blair and Eglinton" (Slaven 1975, 44). By the 1870s the railways had been instrumental in opening up the landlocked mineral fields throughout the west of Scotland and in consequence increased industrial output from Ayrshire substantially. The importance of the developments in transport links cannot be over emphasised. Without the changes within the infrastructure developments in industry and agriculture could not have been sustained.

2.6 Conclusions

The social and economic history of Ayrshire during the period 1600-1870 was one of change and alteration of community, economy and culture. The hegemonic relationship of agricultural change and industrial expansion were critical forces in the re-shaping of the social landscapes of the county. In many senses the period of revolutions in south-west Scotland was more dramatic than any that preceded it and has left a legacy of relict landscapes, particularly within the upland fringes of the county which bear testament to the intensity of that change. This chapter has laid the historical backdrop for understanding those changes as witnessed through the archaeological remains still extant in Ayrshire and has attempted to give some indications of the powerful social changes which led to their construction. This will be

expanded further in the following chapters where the history of change will be related to the archaeological evidence for transformation.

Chapter 3

Industrial Archaeology: period, discipline and approach

"Industrial Archaeology is a good name for the subject" (Hudson 1967, 9)

3.1 Introduction

The above quote by Kenneth Hudson in the first line of his Handbook for Industrial Archaeologists is enlightening in more than one sense. This echoed the creation of a new discipline focused on the study of the archaeological remains of the last two or three centuries. Developed over a very short timespan, it offered an alternative discipline, an archaeology for the post-post-Medieval period (Riden 1973). An archaeology which was more concerned with the preservation and recording of archaeological resources, rather than the archaeology of stratigraphy and material culture. The defining of this subject, as an amalgam of "a growing field of activity among social and economic historians, architects and engineers" (Hudson 1963, 17) indicates its roots. Whether Donald Dudley, Professor of Latin at the University of Birmingham, actually was the first person to utilise the term 'Industrial Archaeology' during the early 1950s (Hudson 1963, 11) or not, is not really relevant. The restricting of the subject to strict chronological, temporal and spatial dimensions, together with a limited defining of the subject's scope, has led to a subject hanging onto the periphery of the greater field of archaeology; a subject which has a low academic profile (in terms of its trained archaeologist element) and a high amateur historian profile. This is particularly evident in England where the subject has remained of high interest amongst local history and thematic interest groups. In Scotland, the history of the subject is rather different, with the non-archaeological professional group driving it forward during the 1960s and early 1970s. However, this was, and is, not supported

by the same level of amateur interest. This chapter will deal with the birth and growth of the subject to the present and try to suggest an alternative route for the study of the recent or later post-Medieval past, and place that alternative route within the context of the study of the impact of industrialisation on rural communities.

The term 'Industrial Archaeology' has become an all-encompassing classification for study of the period from the beginning of the Industrial Revolution until the second world war. There appear to be two main reasons for this; firstly, the fledgling subject needed an all encompassing title, a Bronze age or Medieval period. It needed to be treated as a *bona fide* archaeological subject period. Paradoxically that pigeon-holing has given the term 'industrial' a dual aspect which clearly speaks of theme in equal terms with chronology to the people of the late twentieth century. This is a cultural phenomenon, industry did not begin specifically with the Industrial Revolution in eighteenth century Britain. On the contrary the use of the term 'industrial' to describe a distinct archaeological period in human history is a misnomer. After all industries and manufacturing processes have been around from the Mesolithic period onwards in this country. As Pannell pointed out "some industrial archaeologists would claim that the stone axe factory on Stickle Pike, Westmoreland, which dates from about 1500 BC, falls within their concern as it certainly had an element of mass production and was used for trade because the axes were exported all over the British Isles" (1974, 140-41). Industrial archaeology also has a thematic element to it, and this has been treated as having equal relevance within the subject. I would suggest this is not a helpful secondary classification for an archaeological subject period. Why should archaeologists of the recent historic past deal specifically and solely in some cases

with industry ? This happens in no other sphere of archaeology and leaves industrial archaeologists wide open to taunts of being simply architectural historians and having nothing to do with archaeology as such. This thematic definition of the subject followed a need to describe industrial monuments so that the scheduling process could be utilised in the heady days of urban renewal in the 1950s and 1960s. Palmer has discussed this already in her *Antiquity* article of 1990 where she suggests that:

> "industrial archaeology remains outside the mainstream, partly because industrial archaeologists have never made up their minds whether it is a thematic or a period discipline" (1990, 275)

Palmer's highlighting of this issue is of note, as it seems to imply that the discipline will not mature any further until this is resolved. This may be easier said than done however, as the vast majority of those within the discipline are there for the love of it. "It is largely as a part-time, amateur interest that industrial archaeology has flourished" (Palmer 1990, 275). The core of people who are at the heart of the subject are unlikely to take to a wholesale radical change of approach in terms of dealing with what for many is their hobby. If change is to come it will need to be led from the academic sector, and this will not occur overnight (see section 3.2 below).

Hudson, the most prolific of writers on industrial archaeology, has suggested that industrial archaeology's roots were firmly based in antiquarian societies. In his 1981 publication, *A Social History of Archaeology* he tried to put the subject within a greater antiquarian tradition of interest in historical development by developing and

analysing the growth of amateur societies. Societies such as the Cumberland and Westmorland Antiquarian and Archaeological Society grew from original interests which were much wider than simply archaeology as a cultural definition in the late twentieth century. That is, archaeology was not simply about excavation, recording, conservation and publication in the sense we recognise it today. On the contrary, early interest had a much wider focus, delving into fields as diverse as natural history and ancient documents. This is reflected today in societies such as the Kintyre Antiquarian and Natural History Society or the Dumfries and Galloway Natural History and Antiquarian Society where a wide range of interests can still be found. Hudson's developing interest in industrial archaeology can be charted via his interpretation of the aims and definitions of the subject. If we develop his interest and writings on the subject further we can perceive his own confused development as to the aims and definitions of industrial archaeology, an approach where he continually contradicts himself within the same publications through time.

1963 Industrial Archaeology: An Introduction

> "Industrial Archaeology, if a personal definition may be allowed, is the organised, disciplined study of the physical remains of yesterdays industries" (1963, 21)

1971 A Guide to the Industrial Archaeology of Europe

"What is meant is the material relating to yesterday's manufacturing and transport which has survived, more or less intact, on its original site" (1971, 1)

or

"It does no harm to visit the watermills, forges, the mines and the tunnels with the workers, rather than machines, uppermost in one's thoughts" (1971, 4)

1976 The Archaeology of Industry

"Industrial Archaeology, a portmanteau term for the surviving evidence of yesterday's ways of making and selling things" (7)

or

"History is primarily about people, not things, and industrial archaeology, as one of the historians tools, is about the part coal-mines, steam-hammers and abandoned airship hangers played in the lives and thinking of the people who designed and operated them" (1976, 8)

1981 A Social History of Archaeology

"it was significant, in view of subsequent developments, that the subject should have originated in the first place as a branch of the humanities, that is, as a study primarily concerned with people, not with things" (1981, 155)

Only in 1981 does Hudson finally abandon the machinery-centric approach and put into unequivocal words the necessity to view industrial archaeology as a human archaeology, an archaeology of the social and cultural sphere. Cossons summed it up as early as 1975 when he said "to regard industrial archaeology as being concerned with only industrial activity within the last two centuries or so is also to reject the cultural definition" (1975, 17). This strikes at the heart of the matter, to be an archaeology is to be a study of the cultural or human past; to investigate settlement patterns, depositional relationships, the whole plethora of human experience. What archaeology is not about is machinery or understanding the processing of materials alone as somehow divorced from the real life experience of human beings. After all the processing of iron may be interesting to the metallurgist, but it holds little interest in itself for the archaeologist, its the effect this process has on the people who undertook it and its effect on society and culture as a whole which makes it worthy of interest. The explanation for the early machine-centric approach to industrial archaeology and the necessity for the discipline to be seen as a branch of archaeology are heavily woven into the historic fabric of the subject itself. The early dichotomy of whether industrial archaeology was a branch of archaeology or simply a branch of fieldwork associated with economic history was very real. Even the most public exponents of the subject found it difficult to draw a clear definition between the subject as a close counterpart of other archaeology's or an equally likely cousin of another discipline entirely. Hudson's honesty in 1963 is startling today:

> "If you ask me to tell you the difference between historical economic geography and Industrial Archaeology I confess I would find it difficult" (1963, 18)

Palmer is much clearer about what she sees as not only the definition of the subject but also the aims of the subject. She clearly expresses this in her article in *Antiquity* entitled *Industrial Archaeology: a thematic or a period discipline* when she says

> "Industrial Archaeology is, then, a branch of archaeology which applies the techniques of mainstream archaeology to a wider variety of evidence than exists for earlier periods" (1990, 281)

The article itself pushes a firm line for a subject that is fully integrated into the wider world of archaeology using all the techniques of archaeology with the added bonus of documentary research. However, the article which purports to define the methodological backbone of the discipline rambles off in the middle into a discussion of typologies for buddles in use in nineteenth and twentieth century mineral dressing. In effect Palmer becomes engrossed in the minutiae of buildings rather than the greater social issues she recommends be tackled. If industrial archaeology is to achieve a greater respect from the discipline in general, then this kind of barn-storming article will need to completely imbue itself in theoretical and methodological archaeology, only then will it disrobe itself and develop into an archaeological heavyweight. This is not to say that there is no place for Palmer's 1990 article, on the contrary it was a very positive piece which has helped the subject to advance itself as

a real alternative. However, at the possibility of sounding over-emphatic it is imperative that industrial archaeology be viewed as a real alternative period discipline; this will mean a major revision of its goals. This will also mean the starkest of choices will need to be made between the period discipline or the thematic discipline. In order to begin this, the very character of the subject will have to be questioned. The principal problem can be characterised in the following question.

3.2 A critical understanding of industrial archaeology as a discipline

What exactly separates archaeology from other disciplines, that is, what makes archaeology distinct from history or geography ? The answer is embroiled in the aims and tools we have and use as archaeologists to understand the past. O G S Crawford's famous definition of archaeology as merely the past tense of anthropology (Crawford, 1953) has been exploited incessantly by writers on the subject, particularly, and paradoxically in one sense, by industrial archaeologists. A clear paradox exists between the writings about the aim of archaeology from the traditional sector of the discipline and the position of industrial archaeologists during the late 1950s and early 1960s. In 1955, the same year that Rix expressed the term industrial archaeology in print, Childe was firmly locating the aim of archaeology as follows:

> "The archaeological record is constituted of the fossilised results of human behaviour, and it is the archaeologist's business to reconstitute as far as he can, and so to recapture the thoughts that behaviour expressed" (1956, 1)

Kenyon four years earlier had expressed similar thoughts as to the purpose of the discipline in her book *Beginning in Archaeology*:

> "To begin with, archaeology is not an end in itself, not just an abstract study. It is the method of finding out about the past of the human race in its material aspects, and the study of the products of this past. These aspects may be the way people lived, the way they worshipped, the way they built, their art, their trade, their travels" (1952, 9-10)

Although the aims expressed by Childe and Kenyon are entirely applicable to industrial archaeology, some critics have suggested that these goals were not pursued until recently. Palmer has stated that "industrial archaeologists have until recently been influenced by the novelty.....of Britain's industrial revolution and by the number of 'firsts' which can be accumulated" (Palmer 1994, 136). There has been a distinct lack of method and theory in their work, Palmer has recognised this and has plainly stated her worry:

> "The concern for those of us who teach industrial archaeology in the academic world, particularly in a Department of Archaeology, is the need for a theoretical basis for our discipline" (1994, 135)

This is not the first time this has been mooted as a problem within the discipline though, other authors have come to similar conclusions over the last twenty years

(Riden 1977; Walker 1978). Palmer clearly notes when she quotes Grant, who is unequivocal about it:

> "Industrial archaeology has neglected almost all theory in some kind of belief that it could approach the material remains of industrial society with no particular methodological or theoretical framework" (1987, 116)

Although threoy should in general arise from observation, to be a *bona fide* archaeology, there has to be more than simply recording the dimensions of factories or warehouses. For industrial archaeology to qualify and be accepted within the greater discipline an approach that has at the centre of it a coherent method and theory is essential, an approach which adopts the study of humanity in the past is the only suitable aim here. To her credit Palmer has recognised this and stated it boldly:

> "Measuring sites and buildings, and researching their individual histories, is not 'doing industrial archaeology'. We need to go further than that, to demonstrate that our distinctive methodology can reveal aspects of the history of man in society that have not been realised before" (1994, 136)

Unfortunately it is clear that much industrial archaeology research has lacked that important ingredient to distinguish it from architectural history. Until method and theory drive industrial archaeology forward it will always be open to attack from traditional sections within archaeology, particularly academic archaeology portraying it as a non-archaeology. It may be the field of rescue archaeology which will tip the

balance and allow a stricter methodology for dealing with the subject to be devised. The growing recognition by English Heritage and Historic Scotland of the importance of the industrial archaeological resource is likely to lead to more coherent approaches for protection and ultimately for dealing with complex industrial landscapes as they come under threat from re-development.

The problems associated with defining a method and theory for the subject are imbued in the historical development of industrial archaeology itself. The subject has been stunted by the need to define the boundaries of itself as a *bona fide* discipline, and by extension create a clear role for itself (Conlan 1979). This general need was pursued with vigour in almost every text on the subject published during the 1960s and 1970s (for example: Buchanan 1972; Butt & Donnachie 1979; Hudson 1963, 1967; Raistrick 1972). This has created a problem in itself as those authors tended to repeat a very strict and narrow definition of the discipline, never really wavering from 'the study and recording of industrial monuments and other artefacts' (Butt and Donnachie 1979, 1). A repeating of the goals of a new discipline was undoubtedly necessary, though it did in effect help to cut off industrial archaeology from the mainstream, by playing into the hands of those conservative prehistorians who saw industrial archaeology as "an impossible mongrel, the ugly offspring of two parents who should never have been allowed to breed" (Hudson 1963, 12). Although Hudson was a bit too vehement in his description, industrial archaeology was castigated as "somehow peripheral to any understanding of the past" (Atkinson 1993b, 5). Instead of the last thirty years bringing a maturity for industrial archaeology as a discipline, with lecturing posts opening up and a continued blossoming of the subject, we instead have witnessed,

particularly in the eighties, a slow, almost imperceptible growth for the academic side of the subject. This has much to do with the economic realities of the period, with cuts in funding affecting the growth of the subject. Industrial archaeology has remained marginal, the domain of amateurs, professional civil servants and museum staff. It has not developed into a fully-fledged academic subject within the university system in the United Kingdom.

Few universities in Britain run undergraduate courses that deal with the archaeology of the industrial period and form part of an undergraduate degree in archaeology. Although this is the case at Leicester, at some of the 'new universities' it is taught as a different subject, unrelated to the broader discipline of archaeology. At Bournemouth for example it can be taken as part of a degree in Conservation Heritage, while at Nene it can only be taken as part of a combined studies degree programme. Paradoxically Nene does not have an archaeology department, whereas Bournemouth does. This is occurring against a backdrop of growth within university archaeology, with 27 university archaeology departments in the country which have seen radical expansion since 1986. In that year only 600 placements in archaeology went through the UCCA system, whereas in 1993 8700 candidates applied for 1250 places (Ralston 1994, 6). The general case for archaeology has remained more or less static in terms of numbers of universities offering undergraduate courses, while the number of students has spiralled. "The trend of rising numbers is likely to continue, as the Government presses ahead with its plan to raise student numbers towards 40% of the student-age population by the end of the century" (Ralston 1994, 6). It is in this atmosphere that industrial archaeology is struggling to find its way academically. In

Scotland the problem is clearly evident, even in the Archaeology Department at Glasgow University which deals in a wide variety of periods, from the Mesolithic to the archaeology of deserted settlements of the Highlands, no teaching of the industrial archaeology at undergraduate or postgraduate levels is being undertaken. The discipline of industrial archaeology is unlikely to progress academically if this situation is not reversed. This however is a catch 22 situation. If this turn-around is to be achieved, then posts will need to be created. To achieve this, industrial archaeologists with a sound archaeological basis will be needed. To ensure this, industrial archaeology will need to be taught to undergraduates. The argument is circular but unfortunately reflects the situation in hand: how can you possibly hope to attract young archaeologists into the discipline if they are not "introduced to the study of industrial archaeology at first degree level" (Gould 1995, 49). This problem has also been reflected in the publishing of major text books during the 1980s; the books that have been produced have tended to come from outwith universities and have tended to be either local syntheses or general inventories, rather than academic discourses. There has been no need to create teaching texts on more than the most basic level. The important texts that have come from the discipline have tended to represent the recording side of industrial archaeology. All very good and well, but archaeology is about more than recording. The Royal Commission on Ancient and Historical Monuments for Scotland's volume *Monuments of Industry* (Hay & Stell 1986) comes to mind in this respect; although this book certainly offered a great deal, with possibly the best line drawings to appear on the subject, theoretical analysis and advances in methodological terms were certainly missing, although admittedly these were not the goals of the volume. However, the beginnings of a revival in the

academic side of what has been called industrial archaeology may be under way in the 1990s with the publication of new textbooks pushing for a more critical approach (e.g. Crossley, 1990; Alfrey & Clark, 1993; Palmer & Neaverson 1994; Palmer & Neaverson 1998). In particular the work of Crossley has addressed the wider context of the archaeological past since 1500. Within the index of his 1990 book *Post-Medieval Archaeology* there is no inclusion of the term 'industrial archaeology' (Crossley 1990, 309-328), although he does discuss the industrialisation of the rural landscape. This is very characteristic of the compartmentalised view held within later historic studies, so the fact that he does not use the term is not surprising. It is not a statement about terminology either in this case, but has more to do with how archaeologists working in the historic period view their own period of interest. This of course is semantic nonsense which does nothing for the study of the recent past. There is clearly a cross-over between industrial archaeology and post-Medieval archaeology which should be reflected, rather than kept apart because of false periodisation.

In Scotland, particularly in Glasgow (once known as the workshop to the British Empire) a crisis is vividly clear. We now face a situation where no academic or amateur organisations exist to record the city's fast vanishing industrial heritage. A recent survey of a small corridor, only 100m wide through the city from the M8 at Kingston Bridge extending south and then south east to the M74 at Cambuslang has revealed a substantial depletion of the city's industrial remains recognised during the only survey, to date, undertaken on the Clyde (Hume 1974). John Hume's seminal work researched during the mid-1960s to the early 1970s, and finally published in 1974, is now 25 years old; a lot has changed in the intervening period. The corridor

survey undertaken by Glasgow University Archaeological Research Division in Autumn of 1993 as part of a larger project looking at the archaeology of a proposed motorway link up through the heart of the city (Driscoll & Atkinson, 1995) was very revealing. This piece of work brought the change dramatically to light, the rapid nature of urban redevelopment during the years since the publication of John Hume's study has left a substantial hole in the industrial archaeological resource base of a city which Buchanan, as late as 1977 was still describing as "outstanding as a subject for archaeological investigation" (Buchanan 1977, 365). Within the research corridor there were 40 standing industrial monuments identified, 12 of which were under direct threat from the motorway construction, and a substantial number had already been demolished since 1974.

The whole notion that industrial archaeology is merely about recording standing buildings needs to be firmly put to sleep. As in all branches of archaeology there is a necessity to record; the very fact that for the later periods we have a possibility of greater survival should be addressed. However, we need to channel all our techniques as archaeologists and employ them side by side with research methodologies in the creation of archaeological histories for the recent historic past. The need for a structured methodological approach to this study as opposed to a site and machinery approach is very important. This seems like stating the obvious, but the field of industrial archaeology has lacked a coherent academic approach over the last thirty years. It is no exaggeration on the part of Alfrey and Clark when they say "there has been relatively little written on the landscapes of industry" (1993, xi). Industrial archaeologists have confined themselves in general to the recording and analyses of

specific sites, although some have recognised "the need to relate industrial archaeological evidence to existing interpretations of economic growth and social transformation and, indeed to use such evidence to modify the interpretations" (Buchanan 1982, 22). This may be a laudable approach, but unfortuneately there are still practitioners within the discipline who suggest industrial archaeology "is concerned with the discovery, listing, recording and where appropriate the preservation of the physical remains of past economic and social activity" (Minchinton 1983, 125). There is little suggestion of interpretative approaches to industrialisation and its impact on historic landscapes. Exploitation of the environment for the procurement of industrial-based wealth clearly influenced not only the relationship between society and environment, but the nature of landscape itself. The understanding of cultural landscapes, with landscapes of industry forming part of that greater landscape, will be essential if any inroads are to be made into the study of the recent historic past. The relationship between settlement pattern and the industrial landscape is inferable from the socio-cultural landscapes, after all they are constituent elements. It is not my intention to address this here as it will be obvious as a recurrent theme throughout this thesis and is dealt with in greater detail within other chapters (e.g. Chapter 7).

3.3 The historical context of industrial archaeology

From the early twentieth century, with the establishment of organisations like the Newcomen Society in 1919, there has been an interest in the history of manufacturing during the period of the Industrial Revolution. Here lie the roots of industrial

archaeology as a modern discipline, not in the early county antiquarian societies of England or Scotland with their wide interests in a plethora of subject matters from geology to history to ancient literature (*contra.* Hudson, 1981). It is contested that the core of individuals who formed the nucleus of enthusiasts during industrial archaeology's formative years led the subject along its current path. To understand this, we need to view industrial archaeology not only within the context of its growth, but also further back in time. The identification by individuals in the early post-World War II period of a whole, seemingly untouched, category of monuments, from the eighteenth and nineteenth centuries is a symptom of an age of radical social change. To clarify this further we need to view the socio-cultural developments of Britain in the second half of the twentieth century. The 1950s and 1960s were decades of huge urban renewal and change, the old was being swept away to allow the new to rise from the ashes of war. Within this spirit of social change it became clear that a previously unnoticed category of remains was being lost forever. Here, in the chronological birthplace of the new discipline, lay the *raison d'être* for industrial archaeology's existence. Paradoxically, this interest in the physical remains (i.e. the archaeology) of industry had been of interest to members of the Newcomen Society from at least the second decade of the century onwards (Hamilton 1964, 74-75). The aims of the Newcomen Society at their inaugural address in 1921 and the aims of the Association of Industrial Archaeology some 75 years later are startlingly similar. The mission statement located within the volumes of the Association's journal, *Industrial Archaeology Review*, express a series of statements asserting the aims of the Association as follows:

1. "To promote the study of Industrial Archaeology and encourage improved standards of recording, research, conservation and publication" (Neaverson & Palmer 1994, 240).

2. "To support individuals and groups involved in the study and recording of past industrial activity and in the preservation of industrial monuments" (Neaverson & Palmer 1994, 240).

3. "To represent the interests of industrial archaeology at a national level" (Neaverson & Palmer 1994, 240).

4. "To hold conferences and seminars, and to publish the results of research" (Neaverson & Palmer 1994, 240).

The constitution and rules of the Newcomen Society which were adopted by a special general meeting on November 16th, 1921, mirror the above mission statement adhered to by the Association of Industrial Archaeology. For points 1-2 & 4 above transpose the following aims of the Newcomen Society:

1. [II.] "The object of the Society is to encourage and foster the study of the history of engineering and industrial technology" (Titley 1922, 77).

2. [II(3)] "To collect and preserve or cause to preserve, locally or nationally, examples, records, MSS., drawings and illustrations of, or relating to engineering work and industrial processes" (Titley 1922, 77).

4. [II(1)] "To disseminate historical information among its members by meetings, intercourse, discussion, correspondence, circulation of notes and papers, and visits to objects and places of interest" (Titley 1922, 77).

&

[II(5)] "To publish from time to time, a Volume containing original papers by Members, bibliographical notes and historical material not generally accessible" (Titley 1922, 77).

Admittedly not all the aims of the Newcomen Society are reflected, but the fact that three out of four of the Association of Industrial Archaeology aims are clearly reflected in the constitution of the Newcomen Society speaks volumes. The Newcomen Society was the original outlet of interest in industrial archaeology, even though it was not called that then.

Prior to the Newcomen Society little formal interest had been shown in the historical development of industries or manufacturing processes. Earlier journals, such as the *Transactions of the Highland Agricultural Society*, although printing notifications of advances in technological processes, including details on both machinery and

production, did not focus on the history of industry itself. Instead they printed material for 'living use', enabling subscribers to access information on the latest developments as they were occurring from the 1830s onwards. That is, for the information that could be utilised from them in the day to day existence of their subscribers, or on a more mundane level for the 'marvel value' they offered in terms of new and exciting scientific breakthroughs within their pages. By the 1920s, and again in the 1950s, the core reason for interest in industry, changed from 'living use' or 'marvel value' to an interest in the past as an entity in itself; a nostalgic view of a fast disappearing past, something to anchor onto in a sea of constant social change. In both occasions the level of interest increased in the wake of social disruption and change after the two great wars of the twentieth century. The changes witnessed in the economic and, consequently, social structure of Britain with older defunct industries shrinking and being abandoned led to an interest in the history of the recent past; the instability of the 1920s and re-development of the 1950s characteristically left many people searching for a way to understand the changing social landscape. One way to do that was to associate 'self' with the disappearing industrial past, a past which seemed to have always been present within the townscapes of Britain.

Hudson has forcefully argued that the diverse backgrounds of the individual contributors to the formative issues of *Industrial Archaeology Review* is indicative of the antiquarian tradition of the early subject. It is difficult to follow his reasoning here; a counter-argument that it is more likely to represent a look back at the past with rose-tinted glasses during a period of huge social upheaval could be set. Support for this can be seen in the development of the new discipline's techniques. The necessity

for industrial archaeology to structure itself around recording and conservation, to the complete detriment of excavation, is of note. Admittedly a strong argument could be made to suggest that the reason for adopting the dualism of recording and conservation, as opposed to excavation, was specifically related to the resource base being targeted by the new discipline's members. This may find further support in the context of the period and the perception that urgency was required to record a fast diminishing resource.

A high percentage of the physical remains were either standing or partially standing structures, therefore excavation as such was not really viable. This could be supplemented by the argument that excavation is a highly specialised skill, so it would be much easier to utilise recording techniques which did not require knowledge of technical details such as stratigraphy and depositional practices. This is not a completely satisfactory answer though for two reasons:

1. During the early post-war period large-scale excavations were undertaken by local amateur antiquarian groups. Well known examples in Scotland would include MacEwans Castle or Little Dunagoil.

2. Survey and photographic recording were adopted because these techniques managed to catch the spirit of the disappearing past, and could be utilised on nearly every site with easily intelligible results.

Most importantly though, recording and conservation allowed the past to be retained in the present and the wheels of social change to be seemingly halted in the process. Anybody could participate, from any background, in this new and exciting development which in a sense allowed the forces of time to be halted and held for future generations to appreciate. This is a constant recurring theme within late twentieth century Britain, the case of the Rose Theatre in London is one of many highly publicised examples of preservation groups attempting to hold back rapid social change and conserve moments in time. It is also reflected on a more professional level within the institutions of the civil service by the greater use of the scheduling process by Historic Scotland, English Heritage and Cadw to preserve not only specific sites from alteration and destruction from development, but from the late 1980s onwards the use of the Ancient Monuments and Archaeological Areas Act, 1979 on large tracts of landscape. This is a new angle which is being employed in Scotland on a growing scale with uncontrolled development of historically important landscapes such as the Dunbeath estates in Caithness halted for the foreseeable future. Although Scheduling a monument does not guaranteed protection from malicious or accidental damage and destruction, it does form a very effective administrative barrier, which in general protects against the development of an archaeological site in the wake of a roads construction or housing development. Scheduled monuments are consistently under threat, a fair proportion of rescue work undertaken by Glasgow University Archaeological Research Division over the last two years has reflected this very well. Everything from the accidental damage of 'the best example of cup and ring markings in Kintyre' (RCAHMS 1971, 57) at Low Clachaig which had to be restored (Atkinson, 1993a), to the gradual erosion and destruction of sections along Caulfield's

Military Way, an eighteenth century military road in the Highlands, which has been used since 1978 as the West Highland Way (Atkinson, 1994). The point is plain enough, to preserve by legislation is not to guarantee protection from damage. This is particularly problematic in areas of high urban development as these areas are most likely to alter during periods of rapid social upheaval. The use of the Ancient Monuments and Archaeological Areas Act, 1979 within this context has been sparing to say the least. In the 1997 edition of Historic Scotland's *List of Ancient Monuments in Scotland* only 12 industrial monuments have been given Scheduled Monument protection within the city of Glasgow. Out of that twelve, ten are related to the Forth and Clyde canal, with only the Lynn Park Bridge (NS 582 593) and the North Woodside Flint Mills (NS 571 674 to NS 573 673) covering the rest of the cities industrial past. Given the speed of destruction since Buchanan stated that the city was an outstanding centre for research in 1977, it seems strange that statutory protection via Scheduling is applied to so few of Glasgow's industrial sites. This apparent incongruity is all the more puzzling when Ancient Monuments Act for industrial monuments covers:

> "canals and associated structures such as graving docks, tunnels, bridges, signal lamps; mills of various kinds, pottery kilns, engine houses, engine and railway stations. It also includes some iron bridges....as well as some important industrial monuments of more recent date, for example a whaling station and a gasworks." (Historic Scotland 1997, intro.)

Since this list was published one small advance has occurred. Following on from fieldwork undertaken at Bell's Pottery, Kyle Street, Glasgow in 1995 and 1996 (Speller 1996a; 1996b), in advance of construction of a car showroom, Historic Scotland have taken the unprecedented step of scheduling the remaining half of the site. Bell's Pottery has in consequence become the first urban site in Scotland of the Industrial Revolution period to be protected by legislation as a non-standing monument (Atkinson 1997). Although there are restrictions on the use of the Ancient Monuments legislation, for example "occupied dwellings and churches in use for ecclesiastical purposes cannot be scheduled" (SOED 1994, 15), they are covered by the provisions set out in the Town and Country Planning (Scotland) Act, 1972. This act affords protection to buildings of special architectural and historic interest, including upstanding industrial remains, however when it comes to demolished or partially collapsed sites they are clearly more suited to scheduling. In essence, the use of Ancient Monuments protection within towns and citys could be exploited to a greater degree.

Little seems to have changed in terms of attitude by the archaeological establishment, although they were relatively quick to respond to the new archaeology of industry in the early days. The Council for British Archaeology's conference of 1959 was the first landmark in traditional archaeology's response to the burgeoning discipline of industrial archaeology. In general very little interest was shown by individual archaeologists to the fledgling subject which appeared unrelated to the usual forms of archaeology, to the perceived consciousness of the greater discipline. This has remained the general case up until the 1990s, although many more archaeologists are

willing to accept that industrial archaeology is a necessity that should be given equal status alongside other branches of the discipline as pointed out above. What this early institutional interest did evoke was a clearer strategy for dealing with, and the placing of, industrial monuments within the greater discipline, as a worthy category of archaeological site. The interest generated within bodies such as the Council for British Archaeology, and later within the Royal Commission on Ancient and Historical Monuments in both Scotland (RCAHMS) and England (RCHME) was crucial for the survival of the subject as a specific discipline. The establishment of recording programmes to standardise not only strategies for recording but the level of information and how it should be retrieved has formed the backbone in Scotland and England to the study of the archaeology of industry. The establishment of the Industrial Archaeology Survey of Scotland (SIAS) by John Hume and Graham Douglas from 1977 to 1982 has left a superb resource, now housed in the Royal Commission on Ancient and Historical Monuments of Scotland. This has latterly been mirrored to a degree by the setting up of the Index Record of Industrial Sites (IRIS) project in England organised by the Association of Industrial Archaeology. Although both these projects have led to a better understanding of what has survived from the period of the Industrial Revolution up until the present, they in a sense have helped to restrict the discipline as well. However, in general, both these archives represent an important, and certainly in the case of the SIAS, under-used archaeological database.

3.4 A pathway to a brighter future ?

It is only the wider view of both history and archaeology that allows a coherent understanding of the past. The large screen version is necessary if the archaeology of the recent past is to reflect the state of play within the discipline as a whole. No one in professional archaeology today would tolerate an approach to past landscapes which is purely site specific, so why should industrial archaeologists ? No Bronze Age specialists would put up with an understanding of their period by focusing solely on the industrial, or for that matter agricultural, side of their period, so why on earth should those interested in the recent historic past focus on industry alone ? It is a complete misunderstanding of the history of not only archaeology, but the human race in general, to believe that a view of the social and cultural systems of a nation during the last two or three centuries can be somehow visible within the remains of its charcoal ovens and textile mills. The problem lies much deeper though, within the very fabric of the subject matter. It is necessary to take a wider view of the recent past and develop social and cultural archaeology's, that is archaeology's that create specifically human-based histories, interesting to read not only within the discipline, but outwith it as well. These can only be derived from a wider understanding of the past, utilising all the tools available from the recent historic period. These can be characterised as follows:

(a) Excavation

It will be essential to develop this side of the discipline as a major component of industrial archaeology. Some excellent work has already been undertaken; in

particular the excavation of the lead dressing site at Killhope, Weardale by David Cranstone (1989) and the excavation of Scottish saltpan sites (Lewis 1989; Ewart *et al* 1996) come to mind; however this is currently the exception rather than the rule. Excavation has a plethora of associated environmental techniques which could apply equally well on excavations of sites from the recent historic past. These however are not being utilised, instead, as at the Basset Mines in Cornwall, clearance of structures rather than actual excavation was carried out (Palmer & Neaverson, 1987). The major aim will be to train archaeologists to view historic sites just as they would Neolithic sites, and consequently utilise all the techniques of excavation on them, while at the same time maximising the number of historic sites to be explored using this technique. In the words of Clark:

> "Archaeologists working in the industrial period frequently leave their trowels at home. The subject often loses the basis of archaeology as a discipline and becomes either the history of technology or local history. Whilst these are both perfectly valid perspectives, they are not coterminous with archaeology" (1995, 45)

(b) Photography

Photography has always played a major role in the recording of standing buildings by industrial archaeologists. Photographic surveys are an integral part of industrial archaeology and archaeology as a whole. However, particularly for the later historic past from the late nineteenth century onwards, the utilisation of archival photographic evidence is available and held within central agencies. In Scotland the National

Portrait Gallery, the Scottish Material Culture Archive (in the National Museums of Scotland), the National Monuments Record for Scotland and the Scottish Industrial Archaeology Survey (both located in the Royal Commission on Ancient and Historical Monuments for Scotland) are all accessible.

(c) Survey

Survey techniques, in particular the utilisation of standing building survey methods has formed the backbone of industrial archaeology over the last three decades. *Industrial Archaeology* and latterly *Industrial Archaeology Review* have been instrumental in publishing some major work in this field. This is currently still a favourite topic within the discipline, for example the publication of volume XVI number 1 (Spring 1994), dealt specifically with standing building surveys of mills. It is important that the expertise developed within industrial archaeology's formative years be maintained, particularly as so many of the sites within the period are still standing. As an equal partner to this, much more work needs to be targeted on surveys of associated industrial landscapes. With advances in recording technology, utilising electronic techniques like computer logging from EDMs and satellite logging technologies recording of complex landscapes is easily achievable. Advances in presentation and analysis such as GIS can be exploited and allow clearer understanding of distribution and, on a micro level, site phasing.

(d) Documentary research

Unlike other branches of archaeology, the volume of documentary material available is breathtaking. This presents a clear advantage for industrial archaeology as a

discipline over other branches of the subject. Although this has been known and utilised throughout the period of industrial archaeology's development, its application on a site by site scale, and on a larger regional scale has presented a clear focus for the discipline. For the future a clearer integration of regional documentary research with regional programmes of archaeological research offers the optimum opportunity to allow full understanding of the socio-cultural past of Britain.

(e) Cartographic research

Accompanying the use of documentary research is the use of cartographic material. It has proved important in terms of understanding chronological development of landscapes during the last three decades. This is a central tool for understanding the developmental sequence of the recent historic past, a crucial source of information, particularly on an estate-wide basis, with the survival of large numbers of plans produced during the major periods of improvement in the rural landscape, and also within urban contexts.

(f) Landscape Studies

There has been almost no applications of landscape studies to industrial landscapes in Britain to date. One of the few exceptions is the detailed programme of work undertaken at Ironbridge Gorge during the 1980s and finally published in full in 1993 (Alfrey & Clark, 1993). The understanding of past archaeological landscapes is essential in all branches of archaeology, this is multiplied by a factor of ten when dealing with the complexities of the remains of the industrial period. Landscape archaeology is essential as it draws together other techniques, such as documentary

and cartographic evidence, with an understanding of the topography and archaeological stratigraphy of an area of development.

(g) Ethnographic Studies

Finally the advances made by organisations such as the School of Scottish Studies within the field of ethnographic studies gives yet another tool to the archaeologist of the recent past which is not available to the archaeologists of earlier periods. This has not yet been applied in any multidisciplinary approach to the creation of archaeological histories for industrial period Scotland, although it has been applied with very successful results in the field of Medieval or Later Rural Settlement (MOLRS) studies in Scotland. The archaeological advantages are very prominent, and this will lead to a clearer definition of the role of society in the landscapes of industrial and improvement Scotland.

The re-defining of the subject which we currently call industrial archaeology is essential for the twenty-first century if it is to become a viable branch of the greater discipline. Let us not make any bones about this, if industrial archaeology is to become a force in the current economic climate it will need to define itself as part of the academic (i.e. university) system. To do this it will need to shake off any remaining amateurish traces replace them with a coherent strategy for dealing with the recent historic past. To do this the full range of techniques as indicated above will need to be utilised. These need not all be used at the same time, but certainly a widening of the scope of the discipline is essential. This could be done by a radical re-shaping of industrial archaeology as a subject. In this scenario it would be necessary

to bring down the chronological barriers and extend the scope of the subject out of the strict confines of the Industrial Revolution. Then the creation of a new method and theory could be located in an atmosphere of growth and positive research. This in turn would allow the later historical archaeology of Scotland, and Britain in general, to be studied on a macro level. This would not have to mean an abandoning of traditional labelling, the term Bronze Age or Industrial Revolution can be helpful in certain circumstances, particularly in relation to teaching. However I would suggest that the discipline moves away from the rigid boundaries formed by the utility of these terms. After all, the Three Age System of development in archaeological terms is now rather defunct as a critical tool for dating, most archaeologists would agree that the development from the Neolithic to the Bronze Age was not a radical social change overnight, but a much more general alteration of techniques, constructional patterns and socio-cultural change which occurred over a very long period of time. The effects of the Industrial Revolution, or more importantly the 'Improvements', characterised by the enclosure of vast tracts of land and the industrialisation of the economic base of the country, took place in a highly accelerated atmosphere. It could arguably be said to have occurred within decades, and most certainly was being felt nation-wide at approximately the same time. So to utilise the term Industrial Archaeology as somehow on a parity with a Bronze Age is not really applicable in the sense that we normally refer to the Bronze Age lasting for approximately 1500 years whereas the time period covered by the Industrial Revolution (i.e. Industrial Archaeology) could be said at a maximum to cover 200 years. The effect of modern technological advances is having a telescoping effect on perceptions of modern time, with the rapid nature of socio-cultural change leading the human race into ever-shorter

developmental periods, and in consequence leading to the notion that we have now entered the computer or electronic age. Arguably these are simply twentieth century perceptions which will alter and change in the face of history and for that matter archaeology. However, this does not change the label problems facing the study of the recent past.

The simple answer to this is to take the wider view and utilise the American and Australian terminology for dealing with archaeology of the historic periods. The use of Historical Archaeology as a label dealing with the post-Medieval and industrial past has been rejected so far by the exponents of the compartmentalised disciplines which feed off short periods of time and see themselves as periods of study separate from not only the Medieval but from other periods in the later historic past. I would suggest these are not helpful divisions; how can human development be understood by focusing on a period that may only last two or three centuries, to the total exclusion of the rest of human existence ?

3.5 The archaeology of rural industries

Before bringing this chapter to a close it is worthwhile reflecting on the position in relation to the archaeology of rural industries. So far we have discussed the development of industrial archaeology as the main focus of interest in creating archaeological histories of the recent past. It is now essential to ask two further questions in relation to the history of interest in the archaeology of rural industries:

1. What do we mean by rural industries ?

2. Why have rural industries been relatively ignored within Industrial Archaeology as a discipline ?

Although the answers to both questions are inextricably linked it is important that we deal with both separately to allow clarity of understanding. There is very little synthetic discussion of rural industries in the secondary sources, although there is a growing body of descriptive work dealing with certain aspects of what we can call rural industries. These are industries that are constituted to serve particular functions within agrarian communities and in the industrial period as entrepreneurial or Capitalist industries whose function is purely as a money-making exercise. I have defined a difference within rural industries elsewhere as:

> ***Domestic Industries***: "including any industry directly undertaken at a farm steading to process or increase arable production (lime-burning, corn drying/milling/threshing) or to maintain estate services (saw mills, smithies, etc.)" (Atkinson 1995, 8)
>
> and
>
> ***Entrepreneurial Industries***: "industries associated with entrepreneurial investment in extraction or processing of industrial materials" (Atkinson 1995, 8)

Before we develop this discussion further it is worth noting that there has been a general understanding within the literature that agricultural industries were "organised through the owners of landed estates" with the wider influences being "felt throughout the rural community" (Hay & Stell 1986, 1). Although this view is probably correct for the period of the Improvements and the Industrial age, it seems like an over-simplification for the Medieval and post-Medieval periods. The transition of domestic industries from the rural context of townships to the establishment of crafts, in particular within market towns, is not considered in this view of the past. Estates may have formed the original market for many of these occupations (tanning, meat-processing etc.), however their transition and latter-day history was not as a direct result of estate influence. The general notion that estates planned and executed all domestic industrial development should be considered as unlikely, taking the role of the individual out of archaeology and replacing it with a sweeping generalisation. It is quite clear for example in both Highland and Lowland contexts (see chapter 4 for fuller discussion) that the association of corn-drying kilns with individual townships is latterly superseded by the imposition of large-scale estate run corn mills with in-built drying kilns in the late eighteenth and early nineteenth centuries, a fact that would seem to conflict with the received view on rural industries. After all "agriculture has required a series of specialised activities for the preparation, growing and harvesting of produce, be it crop or animal, and for the subsequent conversion of the raw materials into an end product" (Thackeray 1995, 117). Those specialised activities were not a product of the modern age, nor, with a few exceptions, were they discovered as a result of landed estates investment. In a lengthy passage by Harvey in

his book *The Industrial Archaeology of Farming*, the relationship between humans, technology and agriculture through time is characterised:

> "The farm begins with the plant, which is the only means known to man of converting inorganic compounds which he cannot eat into organic substances which he can eat. The plant implies livestock, for many of the crops that grow readily in this country cannot be digested by man who therefore feeds them to animals which produce in return meat, milk, wool, manure and power. Livestock imply a supply of water. Crops and livestock imply the field, which, in turn implies the conversion of natural wilderness to farmland, the provision of field boundaries and commonly some drainage as well. The field also implies a range of tools, implements or machines to cultivate and harvest the crops that are grown there. Finally, the need to shelter harvested crops, livestock, field implements, static processing equipment and the men and women concerned with them implies a variety of buildings. Such are the essentials of a farm" (Harvey 1980, 15)

Harvey's point is that no matter what period we are discussing, whether it be Iron Age or industrial period farming being discussed, the relationship remains the same. This is what differentiates domestic industry from entrepreneurial activity.

The rural landscapes of Britain are dominated by industrial sites and more importantly industrial activities: "the features which developed during the post-Medieval centuries still remain prominent, and in large areas dominant" (Crossley 1990, 3). The

integration of those sites and processes undertaken on them with the alteration to landscape in Britain is a central feature of change during the post-Medieval period. We can characterise this further by developing the definition given above. In this scenario, the answer to the original question, what do we mean by rural industries ? can be answered on a number of levels. Primarily we are defining the spatial location of industries in the landscape, with rural defining the countryside as opposed to the city or townscape. Within this spatial definition we can develop a closer understanding based upon differences in function, place and temporality. If we take as an example iron production in Scotland, the early years up until the beginning of the seventeenth century are marked by small scale production (see Atkinson & Photos-Jones 1995; Photos-Jones *et al* 1998). During the early seventeenth century and again in the mid-eighteenth century the scale is increased to entrepreneurial level, however the context remains rural in character (see Photos-Jones *et al* 1998; Atkinson & Photos-Jones 1997). In many senses industrial development in the rural sphere is dependant on changes which occur temporally to define its scale and by extension function. It is possible to break this down into three clear forms:

1. Domestic Industries:

a) Cottage Industries: activities undertaken on a local level (i.e. within individual dwellings, farmsteads or townships), including crafts and production and initial processing of agricultural produce (for the pre-improvement age).

b) Estate Service Industries: activities undertaken on an estate-wide basis, initiated and funded by the estate and including services and production industries (saw milling, limeburning, tile production and drainage schemes, corn milling etc.)

2. Entrepreneurial Industries: activities undertaken on a regional or national scale, including extraction, processing and production of industrial goods. These industries are in general unassociated with agricultural regimes (e.g. coal mining, ironworking, etc.), though in some cases a direct association is evident (e.g. textile production). They can best be defined as large scale and Capitalist in outlook.

Since we have defined what constitutes a rural industry it is now time to turn to the second, and more cogent question, Why have rural industries been relatively ignored within Industrial Archaeology as a discipline ? Of course the simple answer is they have not been ignored, entrepreneurial industries based in the rural landscape have attracted considerable attention both in terms of specific studies (e.g. Alfrey & Clark 1993) and in more general synthetic works (e.g. Palmer and Neaverson 1994). This is even reflected in Ayrshire itself, for example the ironworks at Muirkirk has been the focus for considerable attention (e.g. Butt & Hume 1966; Campbell 1961-66;

RCAHMS 1992). What is also clear however, is the distinct lack of synthetic work on the cottage and estate service industries. Even recent articles (see Thackeray 1995) which attempt to give an overview of this form of agrarian-based industrial archaeology tend to focus on descriptions of corn mills, textile mills, windmills and saw mills, with little notice of other domestic industries. So why has this been the case ? The simple answers are of course related to the size of the entrepreneurial industries in question, their dominance of the countryside and the high quality of their associated documentary resource base in many cases. We can also see other more complex reasons for the selective nature of study witnessed amongst the secondary sources. It is clear, for example, that preservation or lack of it, has played a role in this; this is particularly relevant in the case of the brick and tile industry where the materials of construction utilised in the building of tile works in particular and their location in prime agricultural lands has meant that few have survived. If we take for example the Royal Commission on the Ancient and Historical Monuments of Scotland's (RCAHMS) volume on the *Brick, tile and fireclay industries in Scotland* (Douglas & Oglethorpe 1993), that lack of survival is clearly evident, so much so that the survey on which the book is based dealt only with the post-1850 sites, as no examples of the earliest sites had survived. However, even this does not justify the lack of interest in the domestic industries. To understand why so little has been done on these sites it is essential to go back a bit and review how industrial archaeology as a discipline began. It has been argued above that one of the critical reasons for the formation of the new discipline of industrial archaeology was the need to find some social stability in the preservation and recording of a fast disappearing heritage. That is, after the second world war, economic and social changes were begun which led to

the recognition by the 1950s of the relict industrial townscapes within cities which were being swept away to make way for a new order. This was accelerated during the 1960s with mass urban renewal programmes in most city centres in Britain. It is in this atmosphere of social change that industrial archaeology came to prominence, consequently the earliest interest in the subject was clearly focused on the loss of those industrial quarters within the major cities. In light of this, it becomes clear why industrial archaeology focused on the entrepreneurial industries to the detriment of the rural sector. The front-line was in the city centres themselves, it was here that mass destruction of the industrial heritage was perceived as occurring, on the doorstep of those who would begin to practice the new subject. As the discipline developed it began to realise that the rural sector was under threat as well, however the die was cast, the major entrepreneurial industries were the battlefield. Agricultural or domestic industries on the other hand were smaller in scale, more dispersed and apparently less important, consequently they have tended to be over-looked until very recently.

3.6 Conclusion

The development of Industrial Archaeology as a distinct discipline from the early post-war era is a fundamentally important feature of archaeology of the late twentieth century. However, the discipline which should be a study of the social and cultural heritage of the human race during the industrial revolution, stands in stark relief with how industrial monuments of the last forty years have been studied. The defining of the discipline along strict chronological and spatial grounds has in essence prevented the discipline from developing into a *true* archaeology. This stunted development has

been accompanied by the utilisation of only a small proportion of archaeology's rich range of tools and has finally produced a form of recording for buildings rather than an archaeological discipline. This is most clearly seen in the lack of method and theory which accompanies industrial archaeology even in the 1990s. Sessions at Theoretical Archaeology Group and the Institute of Field Archaeologists have not really helped this matter as yet, however a number of authors are pushing for an archaeology driven by a structured method and theory (Alfrey & Clark 1993; Palmer 1990; 1994; Palmer & Neaverson 1994; 1998). The fact that so few universities teach the subject as a discipline, even in a period of unprecedented growth and interest in archaeology, has certainly not aided its development. In these circumstances a radical shift in perception and approach is needed to re-present the archaeology of the recent past as just as viable as any other archaeology. After all, the use of a greater number of resource techniques, from excavation to ethnographic and documentary sources, should in reality allow even better archaeological histories to be derived of not only individual sites, but of huge areas of industrial and improvement landscapes. In essence the archaeologists of the historic past have the ability to understand and analyse landscape change over time. The mechanics of improvement and industrialisation, of wholesale change in the landscape can be understood over very large areas. This, however, will only be achievable when the landscape is viewed over a greater timescale.

Chapter 4

Settlement and domestic industries:

chronologies of form and structure

4.1 Introduction

This chapter will be taken up with the problems of assessing the nature and characteristics of agrarian vernacular settlement and domestic industries in the early modern and early industrial eras. The relationship of settlements, both internally to their constituent elements, and externally to the greater cultural landscape will be explored. The processes and mechanisms which dictate the socio-economic realities of internal function and social usage with their implications for form and structure will also be pursued. These aims will be set within a particular landscape context; for the purposes of this chapter (and Chapter 5) the marginal upland landscapes of southern Ayrshire will provide the test region. The relationship of settlements to their domestic industries and the establishment of chronologies will be developed. Part of the role of this work will be to define what exactly constitutes a settlement of the period of early modern to the end of the first phase of the industrial revolution (that is c 1600-1870) in rural lowland Scotland. As part of that definition process a review of previous definitions of pre-improvement lowland settlement types will be integrated with the idea of establishing a 'model' agricultural settlement, which will have the function of allowing the social system to be properly defined in terms of its constituent elements: its form, its structure and its location within the landscape. This should also allow us the use of the model system as a gauge to determine whether value actually exists in any generalisations about rural settlements on a national basis, or whether the internal components of an agricultural social system need to be seen within the context of their immediate environs, their topographic, climatic, cultural/ethnographic, and historical influences, to make any sense of them.

4.2 Settlement and domestic industries: a review and definition

There has certainly been a tendency to view agricultural systems in both lowland and highland contexts as static, even backward (Gray 1973, 107) prior to the main phase of 'Agricultural Improvements' in the eighteenth and nineteenth centuries. Lebon writing in the late 1940s and early 1950s about Ayrshire was not quite as definite about that process. He could see by utilising detailed map evidence that the "rural change between 1600 and 1760 was not inappreciable" (Lebon 1952, 109). However, he still insisted that comparison of Timothy Pont's survey data (1583-96) with the first edition Ordnance Survey maps (1855-7) for the South Carrick region revealed:

> "an exact correspondence, farm for farm, stream for stream will be disclosed. Due allowance being made for the cruder execution of the earlier map, and for variations in spelling, the truth is that many valleys, occupied today by a single or double string of farmsteads, are represented identically on these two surveys separated in time by two and a half centuries" (Lebon 1952, 104).

Lebon's analysis of the settlement pattern of South Carrick throughout the early modern period is striking in its naiveté. The settlement pattern in south Ayrshire was clearly not static, in fact the whole notion that any human settlement, no matter at what period in history can be seen as static seems rather preposterous. Historical geographers have been very clear about this in recent years within their work on agriculture and society (Dodgshon 1981; Whittington 1983; Whyte & Whyte 1991), though authors from other disciplines have tended to dither at the halfway house, by

seeing settlement as both static and dynamic (see Yeoman 1991, 115). Whittington's assessment however strikes at the core of the point, it is clearly more "instructive to regard Scottish agriculture as being in a constant state of flux due to a continually varying set of pressures and aims" (Whittington 1983, 143). In other words, farming in Scotland, or any other nation for that matter, is dependent on a series of variables for its existence and consequently its survival. These variables can be sub-divided into elemental pressures (nature) which farmers have little control over and societal pressures (culture) which tend to be either institutional or can be altered by external forces (see fig 4.1). For the period of this work four pressures can be identified: climate; pestilence; culture; economics. All have important roles in dictating not only the location, but the internal form, building materials and social structure of farming communities up to 1870 and beyond. These are the elements which impinge upon agriculture and consequently the very social structure of farming and in essence create the archaeological record. In reading this it is essential not to view this as a brand of environmental determinism, but to see it as recognition of the powerful interplay between nature and culture which I have discussed more fully in chapter 1, and which plays a central role in the human experience.

Pressure Diagram

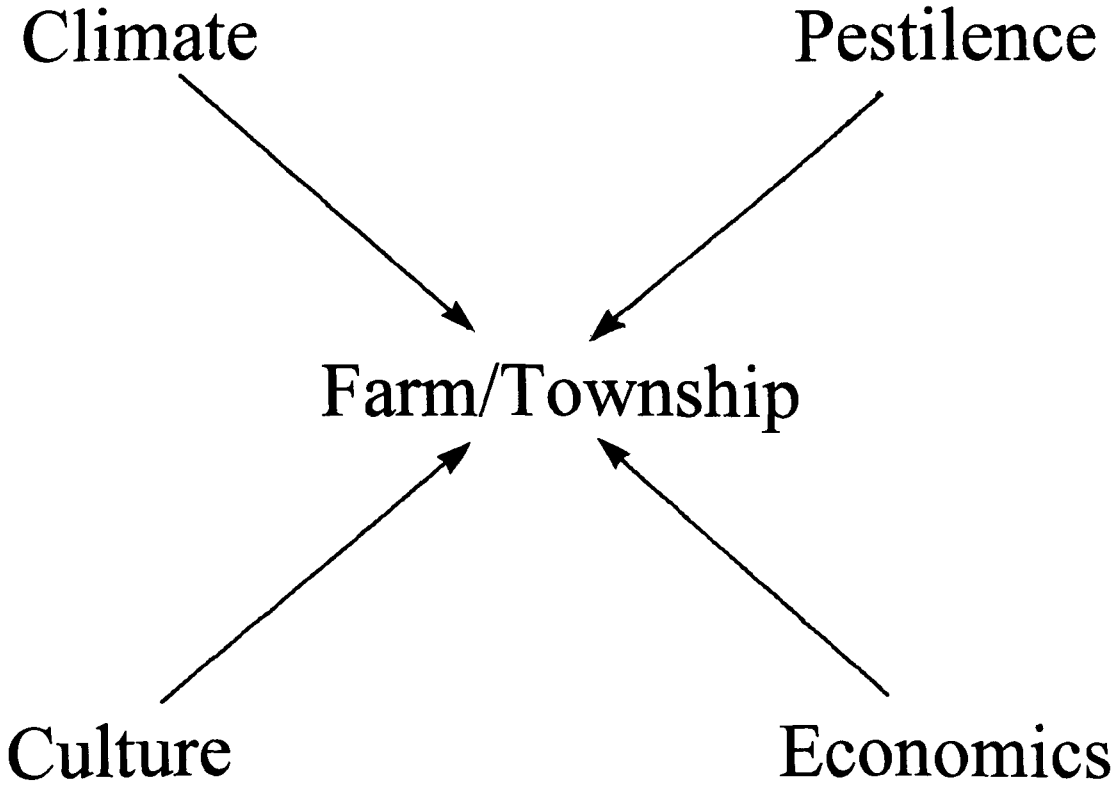

Figure 4.1 Elemental pressure cycle affecting agricultural settlements

We have already mentioned the role of historical geographers in the static/flux debate, however it is worthwhile noting that certainly in the case of Ian and Kathleen Whyte that flux is tempered. Their view of the early modern period sees "continuity rather than drastic change as characteristic of the sixteenth, seventeenth and early eighteenth centuries" (Whyte & White 1991, 54). This stands in stark contrast to earlier historic writers who saw this as a static period in the agricultural history of Scotland (Handley 1953; Caird 1964, 72; Adams 1976 etc.). Whyte had argued that there was little to support this view, other than stereotypical imagery of uniform numbers of fermtouns operating uniform economic and social systems in rural Scotland (Whyte 1981, 5) which changed their farming systems wholestock overnight. In terms of the archaeology of early modern and early industrial periods this may have serious implications in the sense that an argument could be constructed that would infer that social or cultural change was not as dramatic as it could have been in a rapid change-over of systems, i.e. during a revolution. Tom Devine has recently re-vitalised the debate by suggesting that "there does not appear to have been radical change in the management of land in the first half of the eighteenth century" (1994 32), though "important changes were occurring within rural society" (1994 32). In reality the gradual change of social structures over two and a half centuries was probably a far more effective means, a far more effective revolution, than the quick change which the "Improvements" imply within the early writings on the subject. Devine's argument is sophisticated and sees a gradual social change allowing a rapid change in farming practice and agrarian culture to occur by the mid-eighteenth century. If rural society in lowland Scotland was evolving and changing gradually during the latter part of the pre-Improvement period, can we define a model of pre-improvement rural

life as opposed to post-improvement regimes ? Or are we simply stereotyping and generalising about the past in a vain attempt to simplify issues and forms so that we (the archaeologists) can characterise them ? To answer these questions it is essential that we view the previous attempts to define the structure of the rural past and address whether any national view of form and structure is achievable at the moment.

A number of attempts have been made by archaeologists, historians and historical geographers to define what exactly constitutes a pre-improvement agricultural settlement in both lowland and highland contexts. These definitions have tended to place the emphasis on questions of tenure, that is the number of families occupying these communities, and to a lesser extent have focused on the terminology used to define them. From Adams classic definition which generalised that agricultural settlements in the lowlands consisted of a "community of four to eight families of joint tenants who farmed in runrig" (1967, 60), a number of similar attempts have been made which seem to imply that agricultural settlements had substantially larger numbers of joint tenants working them ["from 2 to 8 or more" (Lebon 1946, 107); "from 3 to 8 tenants" (Millman 1975, 96); "between 6 and 12 households" (Whyte & Whyte 1991, 4) etc.]. For a moment if we look at the Carrick evidence, only 2 of the 112 sites identified by the RCAHMS (that is excluding the probable shieling sites) had more than 4 buildings on them. This does not measure up well with the high figures generally quoted for the Lowlands, however Watson's recent (1994) documentary analysis of the Kyle and Carrick region has indicated a particularly complex set of relationships between the archaeology and the history of the area (this work will be developed further below and in chapter 5). The only real attempt to

utilise non-tenurial evidence comes in the specific definitions of Yeoman, whose interpretation of a fermtoun is clearly more complex. It is worthwhile reviewing exactly what Yeoman defines:

> "A fermtoun consisted of a core settlement surrounded by its fields. The enclosed settlement comprised a number of farmhouses, likely to be of 'longhouse' type, with associated barns, byres, stores and pens. Unfree labourers would have lived in small cottages. The constantly cultivated infield rigs, each a strip-field, may have existed alongside hay meadows, depending on the altitude of the location. In some areas the infield may have been separated by a bank or dyke from outfield rigs and pasture, which occupied poorer quality, stonier higher ground. The fermtoun may have an associated but remoter area of shieling (upland summer grazing) lands, a practice first recorded in the late twelfth century (Barrow 1973, 276) but likely to have originated in prehistory" (Yeoman 1991, 115).

It is quite clear Yeoman is approaching this from a Medievalist/archaeologist standpoint, the reference to unfree labourers confirms this. However, in general, his definition is worthwhile as it includes the majority of the key elements that combine together to define any agricultural unit. If we compare this with my own attempts to define a 'model' agricultural settlement for the Medieval to early industrial periods there are clear comparisons (see below, also Atkinson 1995; Hingley *forthcoming*). The only major omission by Yeoman was not to include domestic industries as part

and parcel of the definition of an agricultural site, however I will come back to this later.

4.3 Agricultural settlement units - constructing a 'model'

In assessing the agricultural settlement unit over the chronological timespan between the early modern and early industrial periods it is possible to identify five distinct elements which constitute the core of a 'model' settlement. These are defined as follows:

1.) The settlement, including the core structures of the farm steading (dwellings, barns, byres, stables and related outbuildings)

2.) The associated field systems, including arable fields which may be enclosed or open and can be related to a given settlement (elements of the field systems can be defined as infield, outfield, meadows, rigs, dykes and clearance cairns)

3.) The associated pasture lands, plantations and periodic abodes, including any pastoral lands, plantations, enclosures or shelters related to a given settlement (upland grazing, wooded plantations, head-dykes, sheep fanks and shielings)

4.) The associated domestic industries, including any industry directly undertaken at a farm steading to process or increase arable production (lime-burning, corn drying/milling/threshing) or to maintain estate services (saw mills, smithies, etc.).

5.) The associated communication links, including any connecting routeways between a given settlement and other elements of the economic system (trackways, holloways, droveways and roads)

Before I go on to question the definition of what constitutes a settlement, it is essential to understand the regional-national variation debate more fully. Whyte, as early as 1981, was attacking models of agricultural settlement as "static rather than diversified and dynamic" (Whyte 1981, 5). He was attempting to get away from strict tenurial understandings of the past which saw Medieval or Later Rural Settlements (MOLRS) characterised as a product of the documentary record. In previous attempts to understand agricultural settlements the numbers of people stated within the documentary resources as occupying sites at any given time in the past has become the primary source for interpreting sites. Sites which varied geographically and chronologically could appear to exhibit similar structures based purely on occupancy, a simplified view of the past which led to a feeling that no regional bias in form or type was likely. Whyte, to his credit, was attempting to disrupt this view as early as 1983: "farm structure and with it rural social structure also exhibits regional variations" (1983, 123). The argument for regional variation of settlement form and type has tended to remain in the background until recently. The Historic Scotland-funded MOLRS policy statement project (Atkinson 1995) took this on board as one of the key elements to be pursued via consultation of a number of leading practitioners within the field of MOLRS studies from various disciplines (archaeology, historical geography, history, architecture, environmental sciences).

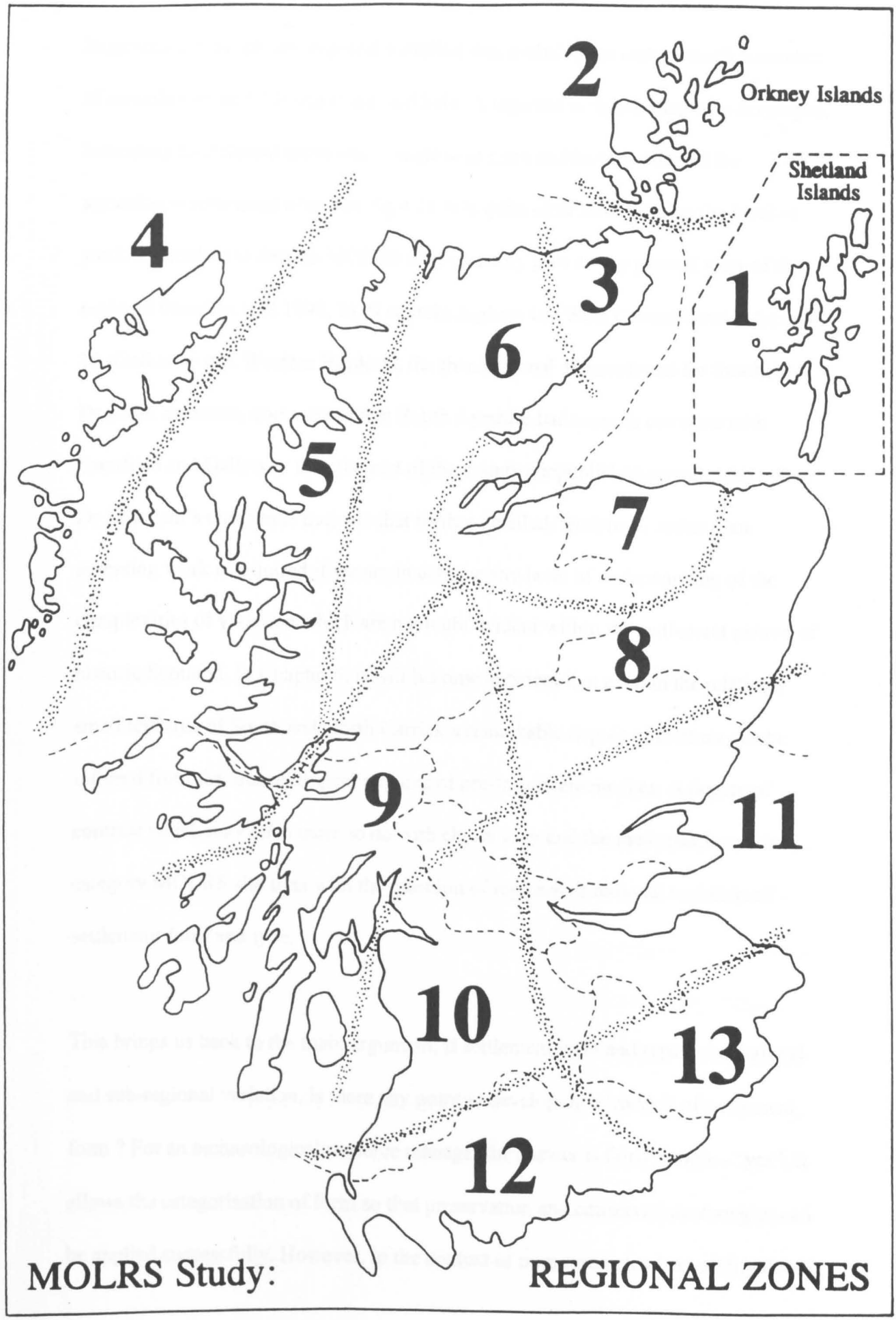

Figure 4.2 Map indicating the regional distribution of MOLRS in Scotland

In general it was felt that regional variation was probably accurate, though a number of contributors still felt that it was unlikely. A regional variation map was developed, indicating 13 different areas where settlement form and history differed for agricultural settlement sites (see fig 4.2). It is quite clear however that the level of work undertaken to date on MOLRS sites can only give a very general view of that regional variation (HS 1998, 2). If we take regions 10 (West Central Lowlands) and 12 (Galloway and Western Borders), the then regional archaeologist for Strathclyde, Dr Carol Swanson, commented that South Ayrshire had more in common with Dumfries and Galloway than the rest of the county (unpublished consultation notes). Dr Swanson's comments indicate that further detailed, analytical, rather than assessing work is required if we are to achieve any level of understanding of the complexities of variation which are no doubt evident within the settlement pattern of historic Scotland. In Chapter 5, it will become apparent that even in the relatively small test area of South and North Carrick a remarkable degree of contrast can be inferred from the archaeological remains of pre-Improvement sites. A degree of contrast which may have more to do with chronology and the inadequacies of the category MOLRS site than with the question of regional or national variation of settlement form and type.

This brings us back to the main argument, if settlement form and type have regional and sub-regional variation, is there any point in developing a 'model' of settlement form ? For an archaeological resource manager the answer is fairly simple - "yes". It allows the categorisation of form so that preservation and conservation strategies can be applied successfully. However, in the context of pure research what validity does it

have ? In one sense it depends on what you are utilising it for. If it is the intention to utilise the model as a guage for assessing whether remains encountered in the field represent a MOLRS site, then this could be helpful. On the other hand, if it is being used as a strict categorisation system, a check list of characteristics, this is more problematic. The fact that MOLRS do vary considerably in form, function and location necessitates that the model be seen as a list of possible elements, which may or may not occur together on individual sites. This is the intention here, to publicise possible combinations of elements rather than to express strict categorisation of what should be present in any given agricultural settlement, in any given area of Scotland. The aim being to present an analytical analysis of MOLRS sites, which can be applied to Ayrshire's sites, as well as outwith the test region.

4.4 Post-Medieval settlements: tenure v accommodation

Watson's analysis of the Kyle and Carrick documents draws a clear distinction between surviving remains in upland and lowland contexts within the study area; she states "the existing remains are not particularly representative of the range and spread of sites which once existed" (Watson 1994, 13). This is a very cogent statement which clearly echoes Stevenson's *zones of destruction* (1975, 104-8), and in an instant recognises the historically specific differential preservation within the area. I will deal with that preservation further (see below), however for the moment, it is necessary to view Watson's statement in a slightly different context. The problems inferred by the unresolved relationship between tenurial fact and accommodation space need to be resolved within the current framework. I would suggest that the resolution may lie

within the very fabric of the buildings themselves. The archaeology of constructional materials may cast light on the problems indicated by Watson. The knowledge that certain non-durable constructional materials were being used in the relatively recent past has been known for some time. The use of turf (Walker 1979, 45-59; Noble 1983; Walker & MacGregor 1993, 4-10; 1996a), clay (Fenton 1970, 28-51; Walker 1992, 48-51; Fenton & Walker 1981, 76-83; Walker & MacGregor 1993, 4-10; 1996a), timber (Hay 1976, 28-38; Walker & MacGregor 1993, Atkinson 1995; 1996), turf/stone (Fenton 1968, 94-103; Fenton & Walker 1981, 76-83; Walker & MacGregor 1993, 4-10; 1996a; 1996b) wattle and daub/rice and stake (Walker & MacGregor 1993, 4-10; 1996a) have all received attention within the literature since the late 1960s. This discussion of the effect and use of materials other than stone or brick is reflected within the primary historical resources themselves, and has consequently been utilised with great effect in the construction of theory relating to the pre-improvement settlement pattern (see Dodgshon 1993, 419-38). There is little doubt now that turf was a primary constructional material within the Highlands prior to landlord re-ordering of the landscape under the guise of improvement. The consistent chain of references from the eighteenth century is in itself proof enough of that. There is even support for the theory in Ayrshire, "farm houses up until the 1740s were often partly or wholly built of turf or of clayed wattle, the gablets being regularly of such materials, as well as the internal partitions" (Aiton 1811, 114; also reprinted in Fenton & Walker 1981, 100). The question is therefore - can an alternative constructional history for Ayrshire be developed to explain the unresolved debate between archaeologists and historians over the tenure-accommodation issue ? To answer this we need to develop the evidence from Ayrshire further.

"In many east-coast lowland areas from Roxburghshire to Berwick, as well as in Ayrshire and Galloway, clay mixed with straw or other binding agents was used as the main walling material" (Whyte 1991, 35). It is quite clear from contemporary historical sources that the use of construction materials other than stone was a common feature of the Ayrshire landscape. This is reflected in passing comments by commentators such as the Rev. John Mitchell in his *Memories of Ayrshire about 1780*: "the farm houses were mere hovels, moated with clay, having an open hearth or fire place in the middle; dunghill at the door" (1842, 255-6; also reprinted in Strawhorn 1959, 35). William Aiton in the Board of Agriculture Report of 1811 gives a clearer analysis and leaves the reader in no doubt that up to around 1750 a tradition of utilising materials from the local physical environment was in full swing:

> "About fifty years ago, the farm houses in the county of Ayr were despicable hovels; many were built in part, and some altogether of turf, or of mud plastered on stakes and basket work. Their partitions, and generally the tops of the gables were of one or other of these materials. Clay mixed with straw, was used as mortar, and the roof formed of strong cupples termed *syles*, set eight or ten feet distant from each other, with their feet reaching near the ground. On these rested cross beams on the sides, called *ribs* or *pans*, and the ones on the top were termed a *roof-tree*. Over these were hung sticks about the thickness of a man's arm, called *cabbers*; and small ones set on top of the wall were termed *up starts*. Some brushwood was laid over the whole; and then divots or sods, into which cut straw was fixed with an instrument called a *theeking*

spurtle. The whole wooden part, or inside of the roof, was denominated the *buggars*" (1811, 4-5; also reprinted in Strawhorn 1959, 59-60).

That tradition of utilising materials derived from both agricultural surplus (straw) and the local environment (turf, timber, clay) was not of course purely a product of the south-west. Walker's work in the north-eastern lowlands and beyond has pushed that distribution much wider (1979; 1981; 1992; also with Fenton 1981), with his survey of the village of Rait, Perthshire indicating that many clay buildings have been altered over time, and consequently are hidden beneath a different external appearance. For the period prior to landlord-driven Improvement in the agricultural zone "the early domestic houses in Scotland were for the most part built of wood or wattles. The latter process was to have a stout double framework of wood interlaced with twigs after the manner of basket making. The space between, which could be made as wide as might be necessary for the desired thickness of walls, was then filled with turf or clay" (Foster 1910, 125). As an interesting aside, in some areas recent work has indicated that the use of traditional buildings techniques, such as 'post and beam' construction and timber gables was still being pursued as late as 1800 (see Atkinson on Grantown on Spey, 1995; 1996; Bil 1996, 5). It is quite clearly the case in Ayrshire however, that the transition between the traditional building materials and stone for lowland farms occurred at an early date (probably in the early to mid-eighteenth century), in fact, according to Morton (1976, 10), before 1810. There are few surviving examples of clay construction, or clay biggins as they were known in Ayrshire. Consequently, the question now relates to degrees of survival and the mechanisms of improvement, rather than a purely tenure versus archaeology debate.

The relationship between lowland farms and upland farms in Ayrshire may of course be different, however for the moment it is the intention to focus on the vernacular settlement pattern in Carrick which has remained principally intact. The archaeology itself appears unlikely to support the clay construction argument with the exception of the 'type 1 sites' (see chapter 5 for full discussion), however many of the sites are constituted by one course of stones at ground level (fig 4.3), which could be expected if clay was used as the main walling material. There is no support however for the fabric of clay buildings completely disappearing over time, so we cannot extend that argument to account for high numbers of occupants indicated by the documentary evidence, against low numbers of buildings indicated by the archaeological evidence for the same sites. What is likely though, is that a second class of structure was being utilised for outbuildings at some of these sites throughout the early modern period. Walker and MacGregor have argued that rice and stake or wattle and daub construction is a likely secondary component of building construction on pre-improvement sites (1993, 5). In a recent communication Walker has suggested to me that this is likely to be occurring in southern Ayrshire, citing the example of Bersu's excavations in Denmark which effectively proved that wattle and daub buildings had been present on historic farm sites (Bruce Walker pers. comm.). Although this is not unassailable evidence, the field analysis results detailed in chapter 5 highlight a high number of sites where platforms were witnessed but no walling was evident, consequently the use of less durable materials may have been in use in South Carrick prior to the improvements. This in itself says little, as only a detailed programme of excavation could prove or disprove this theory.

Figure 4.3 Laigh Dangart township, South Carrick

4.5 MOLRS Settlements: location and excavation strategies

> "Most of the pre-improvement settlement pattern has been wiped out in the Lowlands due to subsequent intensive exploitation of the land, deserted settlement sites generally occur on the fringes of improved land, often in marginal semi-upland locations. Such sites may not have been representative of those in the Lowlands which have been obliterated" (Whyte & Whyte 1991, 4).

Ian and Kathleen Whyte's commentary on the locational positioning of the remains of rural settlements is indicative of the problems of classifying marginal sites as typically lowland in character. The Carrick and Kyle surveys clearly show that the remains of the settlement pattern visible in upland areas do not spread over into the highly productive agricultural low-lying lands within the bailiwick (Figs 4.4 & 4.5). A measure of the numbers of sites from north and south Carrick against the RCAHMS own survey work in north Kyle indicates this very well: a ratio of 141:6 needs no further discussion.

Williams has argued that "reorganisation of the landscape has removed almost completely much of the evidence [of settlement] from the lowlands" (Willams 1984, 95) dating from before the eighteenth century.

MOLRS sites in Carrick

- General Distribution -

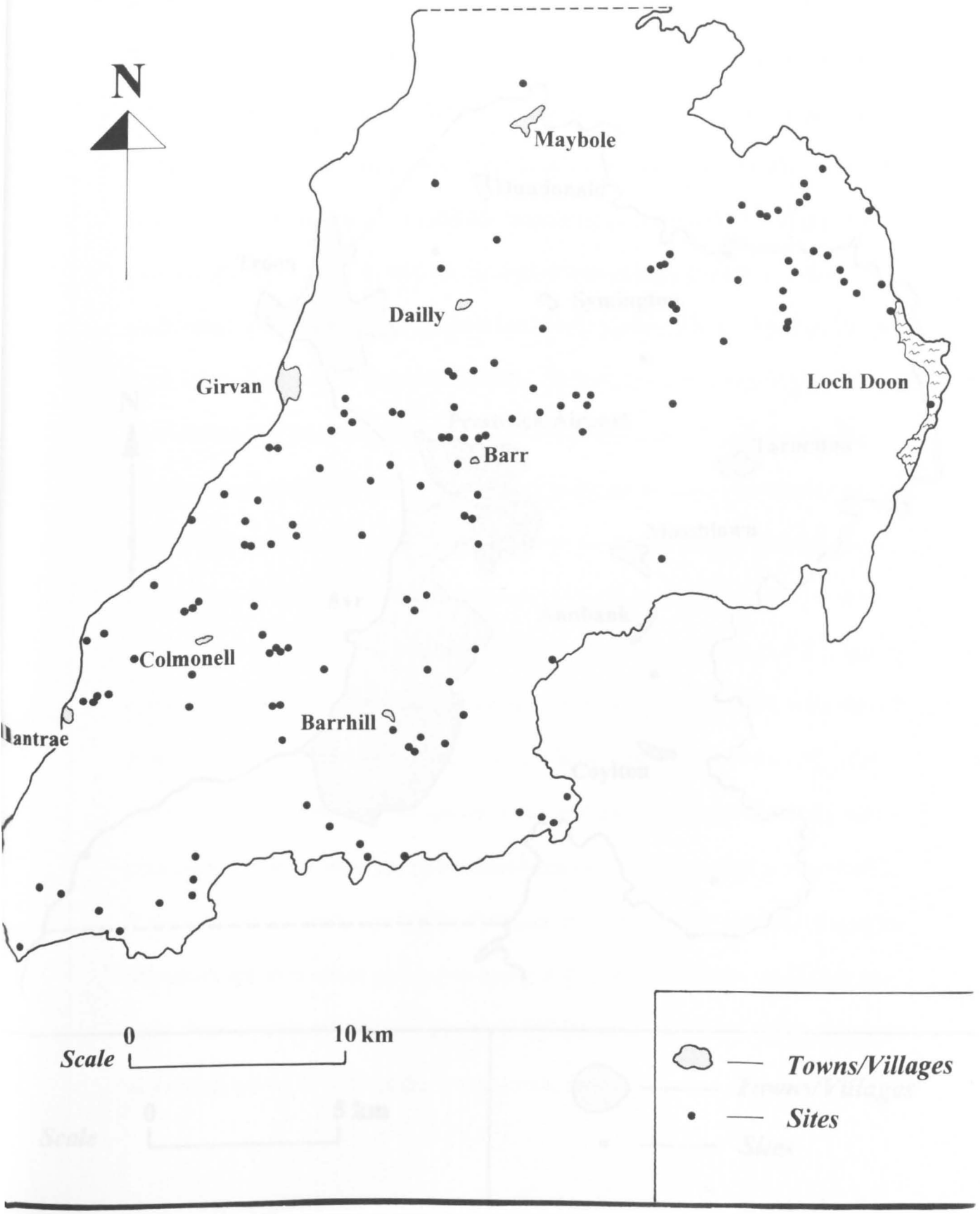

Figure 4.4 Distribution map of MOLRS sites in Carrick

MOLRS Sites in North Kyle

- General Distribution -

Figure 4.5 Distribution map of MOLRS sites in Kyle

This lack of an earlier structured landscape for the Medieval and post-Medieval periods has tended to give rise to the supposition that all the pre-improvement rural dwellings lay directly underneath improved steadings (Yeoman 1991; Hingley 1995; etc.). This need not be the case, and is rather unlikely if we think about it rationally. For a start, only part of the pre-improvement rural landscape is missing, the houses of the social elites and ecclesiastical organisations have tended to survive, as have the village sites. It is the vernacular agricultural settlements which have tended not to be preserved within the low-lying improved landscapes set out within rectangular field systems. The question of differential survival of archaeological remains in high quality farmland as opposed to marginal areas will be pursued below however, to stick with the question in hand, improved steadings built on top of pre-improvement fermtouns should be seen as a generalisation rather than a fact. This is not totally to discount the re-building of improved farmsteads in close proximity to deserted pre-improvement settlements. This did happen across Scotland wherever improvement took hold, examples like Evanachan Farm, Argyll or Balig, Ayrshire come to mind (see Atkinson *et al* 1992 and Chapter 5), however there is little doubt that the negative evidence which is commonly utilised for the fate of the rest of the settlement pattern is over generalised. Of course the majority of pre-improvement settlements may lie in close proximity to current steadings, and be obscured by the plough. If so, they are a resource under threat which could be identifiable by aerial photography, a fact which, if accurate, has not really reached the literature. This seems much more likely than the alternative synopsis which sees the occupants of fermtouns homeless while their new farms were constructed. There is another possibility which has not really been pursued as a option, particularly not in the lowland zone. In this theory the rationalist's

approach is taken a stage further, new farms are not constructed directly over the remains of old fermtouns, but are built either next to or at some distance from the old fermtoun. Robert Burns' farm at Ellisland, Dumfriesshire is a good example of this; here an archaeological assessment tested the theory that Burns' pre-improved dwelling lay next to the improved farmsteading (Atkinson *et al* 1993). There was nothing found to support this theory, however a short trawl of the secondary sources revealed that "Burns himself was forced to live a mile down the river from his farm, near the tower of Isle" (Snyder 1932, 298) while his new steading was under construction. When we look at Ayrshire in particular there is almost nothing in the way of discussion on this matter within the archaeological literature, however in an almost throwaway comment within the primary contemporary sources Aiton (Board of Agriculture Report, 1811) tells us that "ninety-nine out of one hundred of the whole farm houses in Ayrshire, have been built, mostly on new sites, within my recollection" (1811, 116). If Aiton is accurate then a radical re-think of archaeological strategy may be needed to discover the missing vernacular fermtoun sites in lowland Scotland.

When it comes to excavation strategies in Scotland, most practitioners have not really moved on from the late 1950s. Scottish archaeology as a discipline is still trying to resolve old debates over the locating of Medieval settlements under post-Medieval townships. Fairhurst's excavations at Lix, Perthshire between 1959 and 1961 highlighted a strategy that sought to "establish the form and functions of the characteristic buildings, to verify the late date of the ruins as suggested by the documentary evidence, and to discover if possible, indications of an older settlement pattern" (1968-9, 181). The critical element here was the excavation of sites which

had a documentary history extending back into the Medieval period, even though the form of remains visible were clearly of post-Medieval date. Fairhurst had already recognised that the visible settlement pattern at Lix was a product of landscape re-ordering during the late eighteenth to early nineteenth centuries (1960, 74-76), though he still found it "difficult to escape from the idea that the ruinous buildings, with their primitive form and appearance of antiquity, were far older than 1800" (1968-9, 181). At Rosal, Sutherland the strategy was once again built on "excavation of sites where continuity of settlement is known to have occurred" in an attempt to "throw light on the vexed problem of house type and settlement form in earlier times" (Fairhurst and Petrie 1964, 150-1). Here as at Lix the outcome was similar "the connection between Rosal (and Lix) whose remains we studied and the township of rather earlier times before change set in" (Fairhurst and Petrie 1964, 161) could not be resolved. The documentary-based strategy for excavation has formed the backbone to work on MOLRS sites in Scotland over the last forty years with characteristically similar results. Excavation and trial trenching on a variety of sites, located disparately throughout Scotland such as Lour, Peebleshire (Dunbar & Hay 1961); Lairg, Sutherland (McCullagh 1991); Easter Raitts, Invernesshire (Reece 1994; Wood *forthcoming*); The Gask, Fife (Will 1993) and Over Newton, Upper Clydesdale (Dunwell *et al* 1995), have tended to be inconclusive at best. It would appear that alternative strategies may be necessary if we are to achieve any clarity at all. In the broadest of terms, although the full range of archaeological techniques have been available to historical archaeologists in Scotland there has certainly been an excessive focus on documentary and cartographic evidence when it comes to devising strategies of excavation. This is probably a product of the added value of these sources which do

not aid work in the prehistoric period. Having said that, it is clearly time to move on and adopt other techniques if we are ever to resolve the seemingly age-old question - can we locate the Medieval rural settlement pattern ? There have been some attempts to do this, most notably the work of Pollock in the Lunan Valley (1985) and Driscoll in north-east Fife (*forthcoming*). Pollock's use of aerial photography produced some promising results, though in the final analysis he was unable to identify settlement cores, whereas the Scottish Field School for Archaeology's (SFSA) work in Fife merely utilised the superb aerial photographic record for the area and were able to add immensely to our knowledge of early Medieval settlement. Aerial photography is an obvious way forward in terms of the lowland arable lands in Scotland, however it has its drawbacks. The SFSA's 1991 excavations in Fife are a classic example of what appeared to be an interesting cropmark site turning into a four-week excavation of a Medieval field system with no trace of the said cropmark (Freeman *forthcoming*). It is clear that we need to develop a multi-layered strategy for identifying pre-improvement sites in lowland arable plough zones. Pollock (1985) had this in mind when he integrated limited excavation with aerial photography. However, although the aerial photographs were able to identify the location of cropmarks which proved to be kiln complexes, he was unable to identify the subtler changes produced by settlement areas. This brings us back to the point raised above with regard to constructional materials. If we are looking for sites which are constructed from ephemeral materials such as wattle and daub or turf and timber, are we likely to pick it up using aerial photography on its own ? Recent work by MacGregor and James in north-east Fife has by chance supported this argument. During the archaeological field assessment supporting the new Glenrothes to Cupar water main improvement

pipeline, an area to the south-west of Cupar known as North Scotstarvit was targeted, as the aerial photographic coverage suggested that the existence of ring ditch enclosures indicated an area of prehistoric settlement (MacGregor & James 1995, 5). After the machining of the pipeline corridor a site was located which after excavation proved to be a Medieval rural settlement core consisting of a number of linear trenches, spreads of debris and structural components (see fig 4.6). A substantial amount of contextualised 13th to 14th century pottery (B. Will pers comm) was recovered. On completion of the work the excavator re-examined the aerial coverage to see if this site could have been identified prior to stripping (see fig 4.7). The only element which was clearly identifiable on the aerial photographs was the corn drying kiln some 20m to the north-east of the settlement core. In his own words the excavator characterises the problem, "in many cases cropmarks can only provide a very coarse indication of the presence of archaeological deposits, and cannot provide even basic information such as date or function. Much of the cropmark evidence here (North Scotstarvit) could easily have been dismissed as relating to changes in the underlying geology" (MacGregor & James 1995, 29; MacGregor *forthcoming*). The ephemeral archaeology witnessed at North Scotstarvit may also have been in existence in the Lunan Valley, hence Pollock's inability to identify Medieval settlement sites "confidently in the cropmark record" (1985, 357).

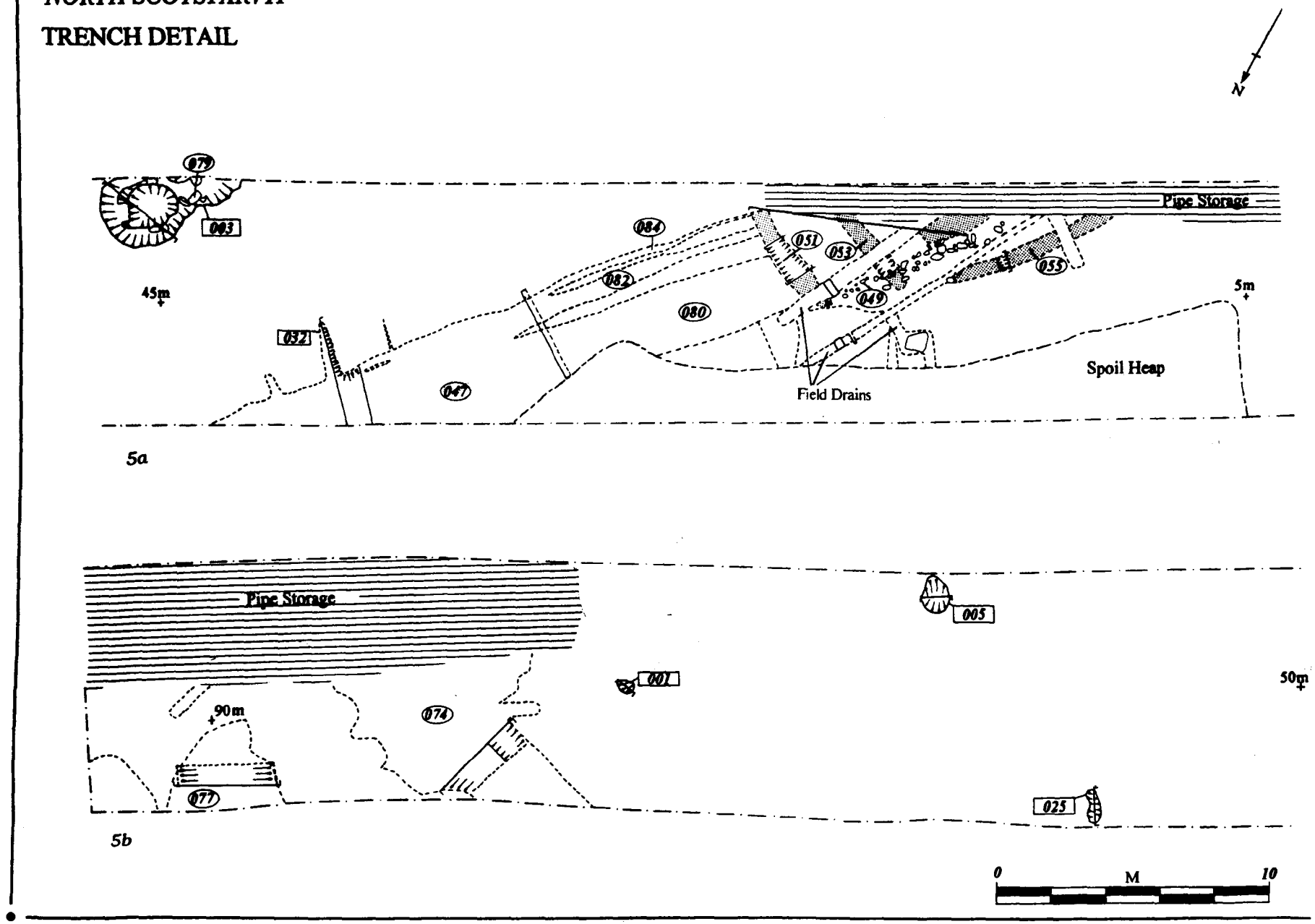

Figure 4.6 Site plan of Medieval settlement at Scotstarvit North, Fife (courtesy of G MacGregor)

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If the argument above is true then what techniques can we employ to identify ephemeral sites. Field walking is certainly a possibility which has not really been exploited for this type of site, with the notable exception of Springwood Park, Kelso. Prior to Dixon's excavations in 1984, this site had been located by Martin in the mid-1960s by "the large volume of Medieval pottery recovered from the field" (DES 1967, 26). Field walking for this period has technical difficulties though, as large volumes of Medieval pottery were introduced - as household waste - into the plough soils of the eastern lowlands in particular, during the Medieval and post-Medieval periods. But in general it could be utilised to better effect. Other possibilities exist, which may be able to target the very nature of human occupation and the ephemeral materials of construction themselves. The use of phosphate analysis on excavated sites of the prehistoric period in Scotland has been an important tool for archaeologists attempting to decipher activities on sites, particularly on plough truncated sites where the positions of structures and animal pens can be inferred from the high phosphate readings in these areas. Banks has recently (1996) adopted this and applied it as a prospecting tool in the analysis of early historic prestige sites and settlement sites, with the aim of identifying areas of satellite settlement which have now been totally removed from the archaeological record. His work at Dun Lagaigh, Macewan's Castle, Dunbeath and latterly North Pitcarmick has taken the notion that phosphates remain in the soil over long periods of time and on a macro scale of analysis can be utilised to identify the location of settlement cores. This is a critical step forward in the development of new methodologies of analysis and taken together with Williams work on Rath sites in Ireland (1983) should help in the future identification of hidden settlement patterns. The 1996 season of the Bragar Townships Project was a tentative

first step in this process utilising phosphate analysis targeted on known settlement locations and prospecting for hidden settlements in the landscape surrounding them. This was supported by geophysics and in later seasons will be tested by trial trenching to assess the effectiveness of the methodology (see Atkinson & Banks, *forthcoming*). So far we have in general discussed how strategies can be developed to target missing elements of the rural settlement pattern in lowland Scotland; but upland Scotland has the same problems and needs to be taken into account. The identification of a new class of structure, known as a Pitcarmick-type building by the RCAHMS in 1990 has led to an important phase of work in the zone of survival. Pitcarmick-type buildings are essentially longhouses which show certain defining characteristics:

> "Most have rounded ends or angles, their side-walls are often slightly curved, some appearing as bow-sided, and they are usually broader at one end than the other....the majority are from 15m to 25m long, and almost invariably they measure between 7m and 8.5m in maximum width. The floors of about half of the buildings are partially sunken, usually at the narrow end....[and]....there is normally a single entrance at either the mid-point of one of the long sides or slightly off-centre towards the wider end" (RCAHMS 1990, 12)

The three seasons of work at Pitcarmick North by Barrett and Downes has led to the surveying, excavation and dating of this form of structure (see Barrett & Downes 1993; 1994; 1995). The strategy itself was not innovative as such, but it did seek to relate prehistoric and historic exploitation of upland landscapes. The radiocarbon dates have classified the new form of construction as Pictish.

In general, then, archaeology has tended to take fairly conservative strategic measures in targeting MOLRS sites until the very recent past. It is clearly time to develop more sophisticated weapons in our armoury if we are ever to achieve an answer to the Medieval rural settlement question. "Many questions remain unanswered, and cannot be answered without large-scale excavation" (Pollock 1985, 397). This is undoubtedly true, we do need to invest in large-scale excavation strategies to fully appreciate the wealth of information on MOLRS sites which is contained under the plough soils. We can make a start by developing and employing new methods of discovery, which in the final analysis may be more rewarding than expending huge amounts of energy and money on large-scale excavation on its own. A combined approach is needed, an approach which is structured on research values rather than rescue necessities. Only then will we be in a position to say whether Pollock was right when he stated that "there is no distinct Medieval landscape" (1985, 397) waiting to be discovered.

So far we have concentrated on the sites which have been published and dated. This however is only a small proportion of the total sites which have been excavated or partially excavated in Scotland since the mid-1950s. *Discovery and Excavation in Scotland* and Historic Scotland's own records indicate that as many as 102 sites have been excavated or partially excavated since 1955 (see Appendix 5). If we look to the three main archaeological journals in Scotland which published excavation reports (*Proceedings of the Society of Antiquaries of Scotland, Glasgow Archaeological Journal, Transactions of the Dumfries and Galloway Natural History and Antiquarian Society*) and the two British period society journals for the Medieval and post-Medieval past (*Medieval Archaeology, Post Medieval Archaeology*) only five

sites have been fully published in the 1990s. Consequently it is no surprise that we find ourselves in a chronological vacuum in terms of dating knowledge. Of those excavations published, only three can be classed as lowland in type and none of them were in Ayrshire. In fact with the exception of Buiston Crannog (Barber and McCrone 1993) which is by no means a typical rural settlement site and the longhouse excavated at Muirkirk in the early twentieth century (Fairbairn 1927), which appears to have yielded a 16th century date (Morrison 1985) and was never fully published, no excavation work has been undertaken in the county on MOLRS remains. This is in itself a bit of a enigma given the level of interest in the MOLRS sites of South and North Carrick by both the RCAHMS (1981; 1983) and Historic Scotland (Watson 1994) in the not too distant past.

4.6 Settlement and domestic industries: establishing chronologies

To date their have been no real attempts to define chronological sequences of development for the rural settlement remains in early modern Scotland. "On the fundamental questions of date we remain broadly ignorant" (Driscoll 1995, 4). This has led to the situation where our own lack of knowledge is forcing us to utilise a descriptive terminology which is at best vague and at worst totally unworkable term for the study of the remains of effectively the last millennium. This is not meant to reject the adoption of the term 'Medieval Or Later Rural Settlement (MOLRS)' completely out of hand. Historic Scotland's attempts in the form of published seminars (Hingley 1993; Foster and Smout 1994), research programmes (Clapham 1993; Watson 1994; Atkinson 1995) and the creation of a multi-disciplinary advisory

group (MOLRSAG) are moves in the right direction. However they are simply attempts by resource managers to characterise and establish the nature of settlement remains so that managerial and mitigating uses can be developed. They are not helpful in the furtherance of research into chronological sequences, as only detailed fieldwork, excavation and survey can achieve this.

Attempts at analysis of the form and structure of settlement remains of MOLRS sites have been fleeting to say the least, particularly in the case of the Scottish lowlands. However, work by Dodgshon (1981; 1994) and others (Whyte 1981; 1983; 1991; Whittington 1983) has attempted to create a structured argument about the development of settlement, its form and relationship to field systems and the very structure of farming communities. In the case of Dodgshon, this is rather paradoxical, as his recent paper dealing with settlement form and structure in the Western Isles comes really as a by-product of a wider research interest in the development of field systems in the area (Bob Dodgshon pers comm). There is a certain amount of recent work undertaken in the Highlands which is very cogent and relates directly to research aims and strategies for the assessment of form, structure and locational analysis within lowland contexts. The results of the research projects currently being undertaken in the Highlands (Bragar Townships Project, Ben Lawers Historic Landscape Project, Easter Raitts Field School and the joint AOC Scotland and Historic Scotland funded field systems project) will have benefits for the future of MOLRS research in the lowland sphere. But a specific programme of invasive research in the lowlands is also essential. To resolve the lack of chronological dating archaeology will need to invest in research programmes which will recover datable materials and in essence pave the

way for the creation of chronological sequences. Walker has argued that excavation work should focus on the hamlet of Rait in the Carse of Gowrie as there appears little doubt that occupation continued from the Medieval and earlier periods (Walker nd). That crucial link between the Medieval settlement pattern and the current village could not however be achieved by survey alone: "insufficient evidence was collected to date accurately any of the structures" (Walker nd, 206).

The question remains, should we be attempting to discover by excavation the Medieval settlement pattern in an area that has had constant development through time ? Or should we be trying to access sites that have been preserved in marginal areas and have not been badly affected by later developments ? As is clear from Appendix 5, to date there have been very few MOLRS sites fully excavated in lowland Scotland. It is quite clear that the most successful of all the lowland excavations into MOLRS sites have been on sites where no further development has taken place after the Medieval period. Piers Dixon's work at Springwood Park, Kelso is an obvious example of this. The site would appear to have had a number of timber phases followed by a stone phase eventually abandoned in 'the first half of the fourteenth century' (Dixon 1988, 2). Following on from this, the development of a substantial soil overburden from agricultural activity in the vicinity protected the site.

To get back to the problems of creating chronologies for the Carrick material, the work which has been done so far is not enough to create absolute chronologies for the Carrick MOLRS sites, only a consistent and well thought out programme of research and excavation could do that. What is clear from examining the Carrick, Waternish

and Kildonan surveys (RCAHMS 1981; 1983; 1993; 1994c) is the close relationship between the community and its mechanisms for industrial processing. After all "physical remains of industries, trades and crafts associated with farming and agricultural processing are to be found almost everywhere in the Scottish rural landscape" (Hay & Stell 1986, 1). To understand the landscapes of improvement more fully we need to re-forge the link between the different areas of agricultural activity on all farms of all periods. Arable farming, after all, has to go through a sequence of events starting with preparation of the ground prior to seeding and finishing with the processing and sale of the produce: figure 4.8 has been produced to diagrammatically display this sequence of events. One of the major failings of recent analyses of pre-improvement agricultural settlements has been the marginalising of domestic industries (*contra* Hingley *forthcoming*), with the focus of attention being placed either on settlement cores, or on field systems. Few authors have attempted to develop a coherent strategy for the analysis of the mechanics of agricultural landscapes in totality. The work which has been done has suggested a link between the rural economy and domestic industries. The best example of this is John Shaw's seminal tome *Water Power in Scotland* (1984), which by any standards is a crucial analysis of the water-powered rural economy prior to the major phase of the industrial revolution in Scotland. Shaw has important and critical information with regard to the development and functioning of grain processing in rural Scotland throughout the early modern period.

Processing Cycle

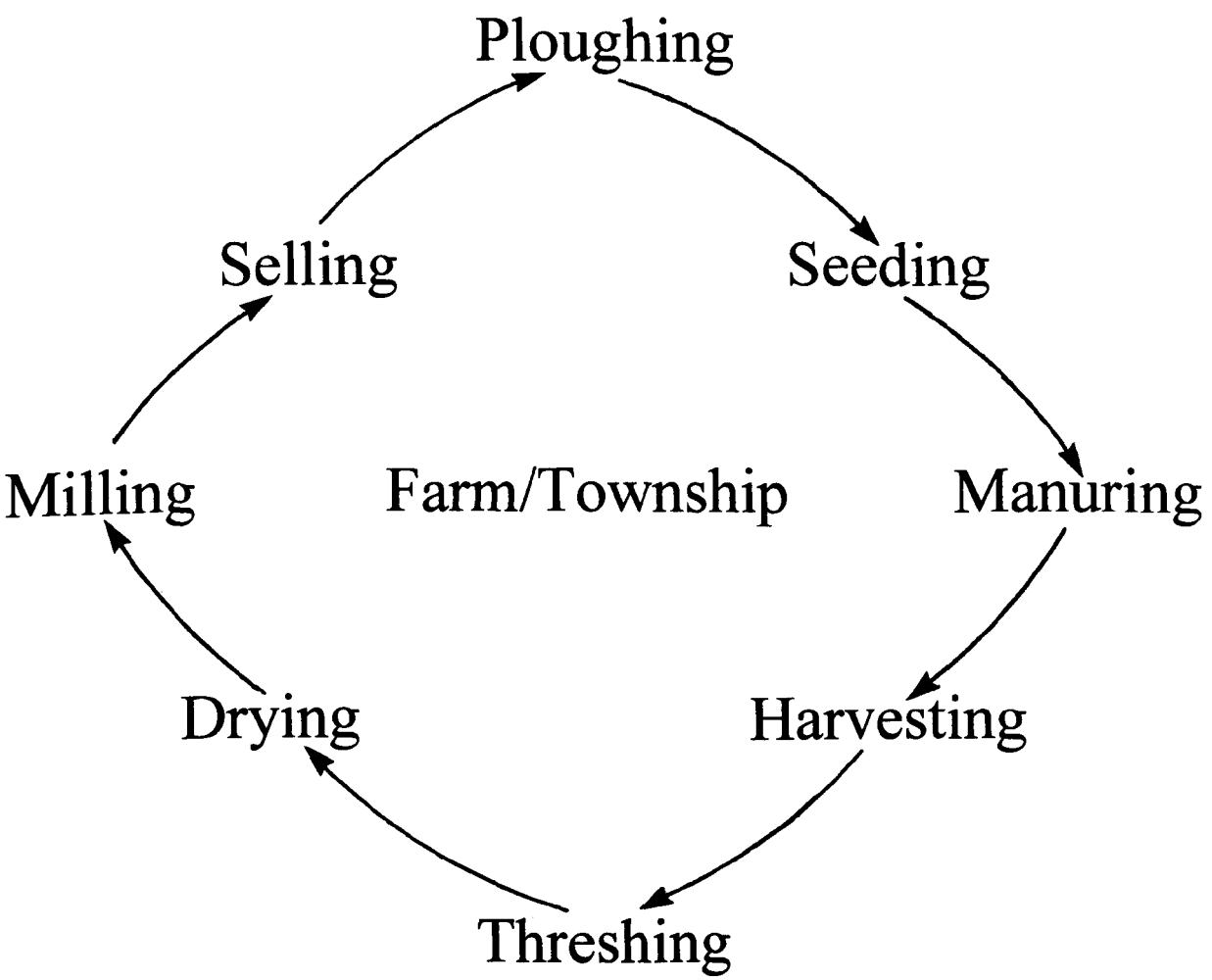

Figure 4.8 Diagram of agricultural cycle

He is very specific about the aims of his work and expresses this in the introduction to the book:

> "The aim of this work is to establish the spatial and chronological development of the water mill in Scotland and to relate this to innovations in technology, impact on the landscape, the rise in steam power and the overall evolution of the Scottish economy" (Shaw 1984, xi).

Shaws work is however the exceptional in this area. In general little coherent analysis of the relationship between industry and agriculture has been pursued. It is not the intention to deal with the marginalising of agricultural processing and domestic industries as a *bona fide* discipline of study here; the reasons for this apparent lack of interest have already been dealt with in Chapter 3. However, we may be able to develop chronologies by *association* as a first step to better understanding. It is my contention that the relationship between domestic industries and settlement pattern is critical in establishing chronologies of form and structure within any historic landscape. The processing of grain for agricultural communities formed a critical part of the regime of Medieval and early modern fermtoun communities. As such, a more detailed understanding of not only the absolute chronology of corn-drying kilns but their role in association with settlements can be used to develop a clearer understanding of the fundamental questions of date, form and use by agrarian communities in the historic past.

4.7 Establishing chronologies for domestic industries: the case of the corn-drying kiln

For the moment then we are reliant on relative chronologies to indicate the way forward. The fieldwork undertaken by the Royal Commission on Ancient and Historical Monuments for Scotland (RCAHMS), the Farm Buildings Survey (FBS) and the Survey of Industrial Archaeology in Scotland (SIAS) have suggested a sequential development of technologies for corn kilns. In the simplest of terms the ubiquitous circular kiln is superseded by rectangular kilns. Shaw has assessed this development specifically in relation to corn mills:

> "In 1730, farms in many districts still had their own circular kilns....in the widespread re-building of the eighteenth and nineteenth centuries, kilns of this type, were replaced by rectangular ones, roofed with pantile or slate" (1984, 115).

There is no disputing this sequence, but Shaw's work was targeted specifically at kilns associated with corn mills and does not take into account changes in the development of kiln technology within individual agricultural settlements. It is quite clear that a substantial variety of corn-drying kilns can be recognised in the archaeological record, from the ubiquitous circular 'mound' kilns positioned on the fringes of deserted settlements in Argyll (see Kilfinan Parish Survey for examples) to the corn-drying kilns attached to barns which appear in settlements as far apart as Halmie in Caithness (Morrison 1996, 105, fig. 23) and Milton of Lawers, Loch Tay (Morrison 1985;

Atkinson *et al forthcoming*), but are also clearly part of the archaeology of Argyll itself. Auchindrain Museum has a perfect example of this form of kiln at the end of one of its barns. This is not a purely Highland issue either; excavations in 1993 at the Gask, Lathalmond (Will, 1993) identified two large circular kilns lying to the north-west of the excavation site, performing a critical role in grain processing during the life of the settlement. There is also the issue of the larger kiln barns to be taken on board. Dixon has inferred (1993) that the large kilnbarns identified on the Waternish peninsula may be found elsewhere at estate centres in the West Highlands. If this is the case, it introduces a further problem in any attempt at assessing the chronology of kiln sites. In both the cases of Waternish and Carrick kilnbarns and corn-drying kilns are noted as part of the pre-improvement remains and may in fact have existed at the same time.

So what can we say about the sequential and chronological development of kilns in Scotland ? Shaw's basic chronology of circular to rectangular probably holds water, however it needs to be qualified. Other different forms of kiln are evident, the massive corn drying kilns of Orkney stand out here, while Fenton has suggested the existence of a second contemporaneous type of rectangular corn kiln, which is common in Shetland and known as a *sinnie*. He also suggests that an example of this was discovered "in the corner of a late-13th century barn in the Viking settlement of Freswick in Caithness" (Fenton 1976, 97). If indeed this does date from the 13th century, I would be very dubious about identifying one rectangular kiln in a Caithness coastal context as evidence of its existence across the rest of mainland Scotland as Fenton goes on to suggest. Both Fenton (1974) and Scott (1951) before him attempted

to produce typologies for corn-drying kilns from the Neolithic through to the post-improvement period, although in both cases the evidence was not based on chronology itself. Since Fenton's work on kilns a substantial number of kilns have been excavated in Scotland. The earlier discussions tended to take the prevalent view that all circular corn-driers were of late date: "given the size and sophistication of the Barbush kiln it may be tentatively dated to the eighteenth century" (Barclay *et al* 1982, 586). Both Feacham (1956-7) and Close-Brooks (1977) came to a similar conclusion. It was only after the publication of radiocarbon dates for the kilns at Abercairny, Perthshire (AD 975-1075 [GU 1927, GU 1928]: *two dates*) and Capo, Kincardineshire (AD 1280-1380 [GU 1929] and AD 1225-1325 [GU 1930]) that this view changed (Gibson 1988, 226). The Capo kilns had a small assemblage of 13th century pottery to support the dates, a feature which has recently been discovered in the kiln site at Scotstarvit North (radiocarbon dates pending), and also present within the earlier kiln excavations at Barbush: "two sherds of green glazed pottery found in the fill would imply a late-Medieval to post-Medieval date" (Barclay *et al* 1982, 585). Recent excavations at Capo, Kincardineshire (Taylor 1996) and Fox Plantation, Galloway (MacGregor 1996) may also add to our understanding of the chronological sequences for corn-drying kilns. As an interesting side issue to this a different design in kiln construction appears to be present in some of the most recent excavations. Instead of corn-drying kilns being positioned on top of natural mounds or slopes, kilns may be dug completely into the ground. The evidence from Scotstarvit North (MacGregor & James 1995) and Fox Plantation (MacGregor 1996) appears to suggest that the ledge for supporting the corn rack is below or at the same level as the contemporary ground surface.

The spatial positioning of kilns within settlement complexes may speak volumes about the technology being used. The location of open topped circular kilns on the very margins of a settlement focus whether that is in a highland or lowland context is important. The Scottish mainland and Hebridean examples are generally sited away from the homestead; "the circular bowl and flue are sunk into the hillside and they often had no accompanying shelter" (Gibson 1988, 220). Where thatch was used to roof dwellings all kilns (corn, lime, kelp etc.) were located away and down wind of dwellings to reduce the risk of fire. This is something which is continually referred to by contemporary commentators, "almost every farmer was accustomed to have a kiln of his own, which not only required frequent preparations, but was extremely likely to accidents by fire" (OSA 1796, 349) or "every farmer had his own kiln; the grain was placed upon rafters covered with straw, and innumerable accidents happened with fire" (Graham 1812, 117). The only way this could change was when technology improved to the point where kilns were situated either at the end of structures or within structures with fire resistant materials for both roofing and walling. It is quite clear from the archaeological evidence that the changeover to rectangular kilns did not happen across the board overnight. Many fringe sites (particularly in the Highlands and marginal Lowlands) retained circular kilns well into the nineteenth century.

An alternative developmental history may have existed in conjunction with the development of sites discussed above. Archaeological evidence from a number of sites points to associated structural evidence, in particular the fourteenth century kiln in the corner of the barn at Jarlshof, Shetland (Hamilton 1932), the possible structures at Dunrobin, Sutherland (Close-Brooks 1977) and Chapelton, Angus (Pollock 1985)

and a number of corn-driers discovered during the Scottish Urban Archaeological Trust's excavations in Scottish burghs (particularly Perth) over the last twenty years. But these in a sense may be red herrings. In the case of the urban corn-driers, their existence cannot be perceived as a threat to their surroundings given their environment. In the context of tanneries, cooperages, smiths' workshops and maltings within Medieval burghs it is no surprise to find corn driers there, their threat value was only one of many. In the case of the two possible structures appended to mainland rural sites (e.g. Dunrobin and Chapelton), Gailey's work (1970), suggested that it was fairly common to have temporary shelters associated with corn-drying kilns. This of course was also the supposition of both Scott (1951) and Feacham (1956-7), and appears in the agricultural reports of the early nineteenth century: "formerly kilns for drying victuals were miserable hovels covered in thatch" (1812, 117). The critical point is not that corn-drying kilns may, or may not have had, some form of shelter attached to them, but the position of the kiln itself in relation to the rest of the settlement core. Effectively you could afford to lose one 'miserable hovel' to fire, but an entire township was a different proposition.

The technological innovations of the second half of the eighteenth century meant many Lowland landowners were producing greater amounts of corn than previously. This occured in conjunction with transport network improvements, and hence provided a means of moving agricultural produce to larger centralised processing facilities. These advances permitted architectural developments, so that larger quantities of corn could be dried and processed from the better quality low-lying lands with less threat to dwellings. In turn this led to the development "of new commercial

meal-mills to which relatively capacious corn-drying kilns were attached" (Fenton 1976, 97). This had the effect in some regions of displacing corn drying from the agricultural routine of many farms, it became far easier to do all the processing of grain at an estate milling centre, or alternatively to pay commercially for this aspect of the agricultural season to be dealt with at a central processing location. Although the restrictions imposed by thirlage meant that grain grinding tended to be dealt with at centralised corn mills prior to this period, the transport and technological developments of the nineteenth century created a support industry which allowed arable produce to be independantly dried, sorted and ground. A good example of this was the recently demolished mill and grain processing complex at Lundin Links, Fife which had functioned until the 1970s and was recognised locally as the best place to have grain dried and sorted prior to selling (local tradition).

So in basic terms, the chronological sequence of kilns may be tied into the technological changes which occurred in the Carrick area. Changes which had a specific chronological timespan and which were probably complete by the beginning of the nineteenth century (Morton, 1976). The role of Lowland estates, particularly in the upland fringe of Ayrshire, was crucial in that transition between the old and new technologies, the pre-improved and post-improved landscape.

4.8 Conclusion

In this chapter it has been the intention to present the context of rural settlement studies for the early modern period and relate this to the need to establish chronological relationships. The position of Ayrshire within MOLRS studies has tended to be marginal, with much of the work undertaken in the last forty years focusing on the Highlands or eastern Lowlands. What has also become clear from this work is the desperate need to initiate programmes of work which not only focus on a more regional basis, but will develop clearer methodological strategies for dealing with the historic past in general. Trying to assess settlement cores and their complex relationships to industries and landscapes is difficult to achieve given the limited work so far undertaken, however the study of MOLRS as a discipline in Scotland is now in a position to undertake that work. Although the role of Historic Scotland and the RCAHMS in the revitalisation of the study of MOLRS is clearly seminal (Atkinson *in press*), the furtherance of the work in Scotland must be undertaken by field practitioners, not cultural resource managers. The archaeology of Southern Ayrshire as will become apparent from Chapter 5 is a resource waiting to be exploited, a resource which has much to offer in terms of historical work (Watson 1994) and supporting archaeological survey work (RCAHMS 1981; 1983) already undertaken.

Chapter 5

De-constructing agrarian settlement forms: with specific reference to MOLRS sites in southern Ayrshire

5.1 Introduction

This chapter will set out the postulation that the form of settlement which has been characterised by archaeological agencies (notably Historic Scotland and the Royal Commission on the Ancient and Historical Monuments of Scotland) as MOLRS sites, that is Medieval Or Later Rural Settlements, varies both chronologically and regionally. A series of models will be constructed which house theoretical propositions relating to form and structure; these models will be tested by the statistical analysis of a database derived from the results of the Royal Commission on Ancient and Historical Monuments for Scotland's (RCAHMS) work within the South Carrick and North Carrick areas in 1981 and 1983 respectively (Archaeological Sites and Monuments Series Nos. 14 and 17). This chapter will also discuss whether the use of such a database can have any validity in establishing links between form and structure in the past, particularly in a specific period in the past, and the archaeological resource as it stands today. As a test of doctoral methodology (see chapter 1 for full method statement and this chapter for specific analytical strategy) a closer analysis of the agricultural remains within the area defined as South Carrick (RCAHMS, 1981) will allow the statistical model developed here to be related to the actualities of physical remains. It is also the intention to test this against the historical resource as well. This will take the form of an analysis of form and structure of the rural settlement pattern in Ayrshire drawn from agricultural reports and contemporary written sources. A comparative discussion will draw both the archaeology and history together as a final stage in the methodology.

5.2 Strategy, aims and statistical methodology

The role of the RCAHMS within MOLRS studies lies at the forefront of investigations into the archaeological evidence of rural settlement studies in the later Medieval and post-Medieval periods. In particular, the series of reports undertaken as part of the afforestable land survey (RCAHMS 1993; 1994a; 1994b; 1994c; 1995), the two Perthshire volumes, volume 7 of the Argyll Inventory (RCAHMS 1990; 1992; 1994d) and the recently established First Edition Survey Project (FESP) have all been crucial in a clearer understanding of this category of monument. However, only limited attempts have been made to synthesise this material and no real attempt at analysis of form has been made. The RCAHMS interest in deserted settlement remains of the historic period did not of course begin with the Perthshire inventories. The material collated by them during the 1970s and 1980s in particular as part of the Archaeological Sites and Monuments Series (1977-1989) is testament to that. These very useful gazetteers of sites ranging from the Neolithic to MOLRS (or in their terminology Medieval and Later Settlement sites) though they did not attempt to do more than indicate the existence of sites. The information held within them is basic and tends to vary between reports, for example the North Carrick report (1983) gives details on compartment numbers and structure sizes, whereas the South Carrick report (1981) gives no mention of these characteristics. It is therefore a critical tenet of this work that the South Carrick material be brought up to the same standard as the North Carrick material to allow a contrast across the reports to occur. The RCAHMS's work has added immensely to our knowledge of MOLRS sites, though without analyses and detailed synthesis conclusions can only ever be sketchy at best. The RCAHMS have

indicated in the recent past (FESP seminar, 1996) that they feel it is not their brief to undertake this work; their job being simply to record and collate the data, so that others can utilise it in synthesising and analysing.

It is from this situation that the strategy for developing a coherent study of the form and structure of MOLRS sites in southern Ayrshire has been initiated. Southern Ayrshire has been the focus of detailed work in the past, both before and after the Archaeological Sites and Monuments Series. In particular the work of Lebon (1952) and Watson (1994) have cast light on the quality of survival of MOLRS sites in the area and, in both cases, the role of cartographic and historical evidence in assessing them (see Chapter 4 for further details). However, it is the RCAHMS which has allowed an archaeological understanding of the remains to be realised by developing the initial data so that analyses of the upland deserted settlements can be pursued.

The strategic approach adopted here was to take the known information on the settlement form of MOLRS sites in North and South Carrick compiled by the RCAHMS in 1981 and 1983 respectively and construct a database which would allow questions with regard to form and structure to be posed. From this base a series of answers could be developed which it was hoped would indicate degrees of probability in relation to the adoption of specific forms and structure of settlements, that is types of construction and the adoption of particular layouts of buildings within steadings and fermtouns. Of course it was realised that degrees of probability were wholly dependant upon the quality of information utilised and the numbers of sites included in the database. Having said that, it was also implicit within the strategy that the level

of information recovered by the RCAHMS was not detailed enough to permit a high degree of accuracy by itself. The fact that information about the number of compartments and the size of structures was missing from the South Carrick material meant in reality that these sites would need to be re-visited so that this information could be included. The re-visiting of the South Carrick sites would also act as a check on whether the form and structure of the categories of site developed during the desk-based analytical work were in fact valid separate categories of site. As a secondary check on the process the decision was also taken to visit the sites in spring time to give a better indication of whether the data recovered by the RCAHMS was in fact accurate itself. This was undertaken not to embarrass the RCAHMS, but because the survey of the area had tended to be undertaken in high summer and autumn, consequently the danger of mature bracken growth obscuring elements of sites was present.

The aims of undertaking closer analyses of the Carrick MOLRS sites can be broken down into general and specific aims, that is aims which form part of the general methodology of understanding the mechanisms of social and cultural change between the late Medieval and early industrial periods, and secondly specific aims related to a better understanding of the chronology, form and structure of MOLRS sites in the Carrick area. In terms of general aims "the form of dwellings and their arrangement on the land are basic components of the rural landscape and an understanding of the morphology and genesis of villages, hamlets and farmsteads is essential for a proper appreciation of the rural environment" (Pacione 1984, 9). Michael Pacione's definition is a useful starting point for any analysis of the form and structure of settlement

remains in the landscape. His recognition of the importance of form and structure as key components of the cultural landscape needs to be developed further. It is not enough simply to rely on the structural characteristics of dwellings themselves. A closer analysis of the component construction of settlement cores and their associated elements, including outbuildings, domestic industries, enclosures, communication links, field systems etc. is also necessary. This is necessary to identify relationships and the grouping together of specific elements as identifier components of structure and form of specific categories of abode. On a more particular level, the lack of chronology for the Carrick sites has left a gap in our understanding of the development of Ayrshire. The lack of correlation between the physical archaeology of southern Ayrshire and its history is certainly problematic and needs to be addressed.

5.3 Stage 1: Constructing and Questioning the primary dataset

The primary dataset was developed so that what may be termed key categories of MOLRS site could be identified. To achieve this the information drawn together by the RCAHMS in their Archaeological Sites and Monuments Series volumes for South and North Carrick (1981; 1983) has been summarised and incorporated into a database which is appended at the end of the thesis (see Appendix 6). This database allows us the opportunity to test whether the answering of specific questions with regard to MOLRS sites form and structure can be statistically inferred from the summarised RCAHMS data, and in effect assays the possibility of using such databases not only for the Carrick region, but on an inter-regional level as well. The data from the Carrick assessments covers 141 sites. For each site a certain amount of

information is given, including site name (topographic), site name (historic, if known), national grid reference (6 figures), map sheet reference, number of dwellings, enclosures and kiln/kilnbarns, cultivation remains, cartographic evidence and historical information in some cases. By the surveying and publication of the North Carrick material (1983) two additional classes of material had been added; the number of compartments within buildings and the dimensions of buildings. Because the last two categories do not extend across the entire area they have not been included in the primary statistical analysis of the database, but they have critical importance for understanding settlement typology and are included in the secondary dataset (see below).

In common with any statistical analysis, the problem of background noise, in this case from two major sources, differential preservation and socio-historical change, make the resulting database difficult to interpret. In an attempt to cut down on the background noise the sites noted by the RCAHMS as huts or circular buildings have been cut from the analysis phase on the grounds that they probably represent shielings rather than core agricultural settlements. Bil's work in the shielings of the Central Highlands has indicated that the practice of shieling was quite considerable over large areas of Scotland, particularly in relation to upland or marginal land use. He is very specific about the prevalence of transhumance systems, "as the Medieval centuries past, transhumance became restricted to the Scottish Highlands" (Bil 1990, 3). What exactly these circular buildings represent in the case of the Carrick examples has not yet been clearly established, however the work of Angus Winchester in Cumbria has indicated the use of shielings in marginal areas as late as the seventeenth century

(Winchester, pers comm). This is supported by Bil's recent studies in the Ben Lawers area which suggest occupation into the early nineteenth century (1996, 11). Sites like Chirmorie 2 (NX 220 760), set behind a small natural knoll and consisting of three small oval structures (c. 5 m by 2 m in size) with evidence of low earthen dykes at c. 220 m OD would appear to be transhumance sites. Their date is however unknown, they may represent elements of the Medieval landscape.

For the moment, if we remove the possible shieling sites from the equation this brings the total of depopulated core agricultural settlements to 112 for the entire Bailiwick of Carrick. Primary analysis of the database indicates nothing unusual within the data, for example graph 1 indicates the number of buildings per site (see fig 5.1).

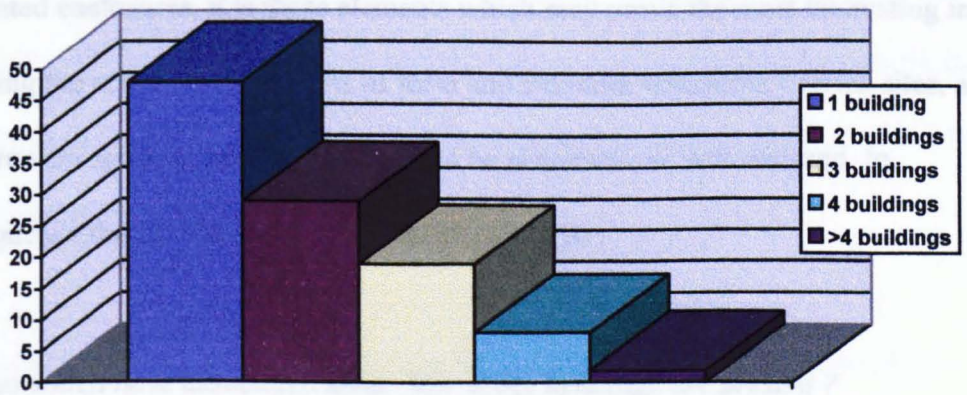

Figure 1: Number of buildings per site

A clear linear relationship exists, starting with sites of 1 building which appear in the greatest numbers and showing a gradual decrease in numbers of sites as the number of buildings per site increases. Although this appears to be a simple relationship, there

may be complex reasons behind such a pattern. It does not necessarily imply that the majority of settlements in the Carrick region were of a 1 building form during their use, on the contrary this may simply be a reflection of differential survival of building types. For example "the use of less substantial materials for barns and other outbuildings was a common practice in Scotland" (Walker 1993, 4-10). They may not have stood the test of time as well as the more substantial dwellings, thereby creating a false impression of the form of steadings viewed from a contemporary perspective. I will come back to this point later in this discussion.

One of the most interesting aspects of the Carrick MOLRS remains is the survival of a substantial number of kiln sites associated with the settlement cores. In total 25 out of the 112 settlement sites have kilns or kilnbarns associated with them, approximately 22.5% of the total. Together with the number of buildings per site and the number of associated enclosures, it is these elements which may prove the most interesting in assessing the constituent elements of form and structure within the Carrick sites, as here are very specific elements, which can be characterised and analysed. In consequence the first question to ask the database is:

On sites which have associated kilns, how many buildings are present ?

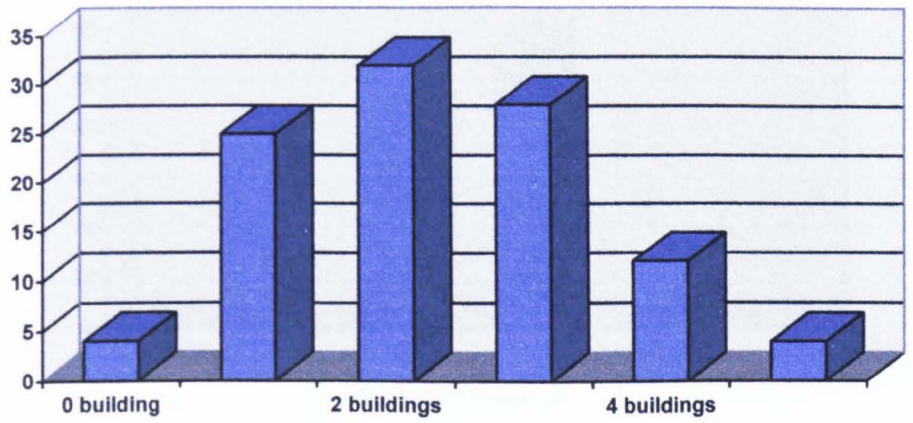

Figure 5.2: Percentage of kilns per site

Analysis of all kilns in relation to the numbers of buildings per site (see fig 5.2 above) indicates a peak in the 2 buildings per site category, with the 3 buildings per site category close behind. However, the 1 building per site category is in close contention as well. Reading between the lines I feel that this may be a false impression, possibly as a result of differential survival. If we take the relationship between kilnbarns and the number of buildings (kilnbarns sites form 28% of the total number of kiln sites) the next question becomes:

On sites which have associated kilnbarns, how many buildings are present ?

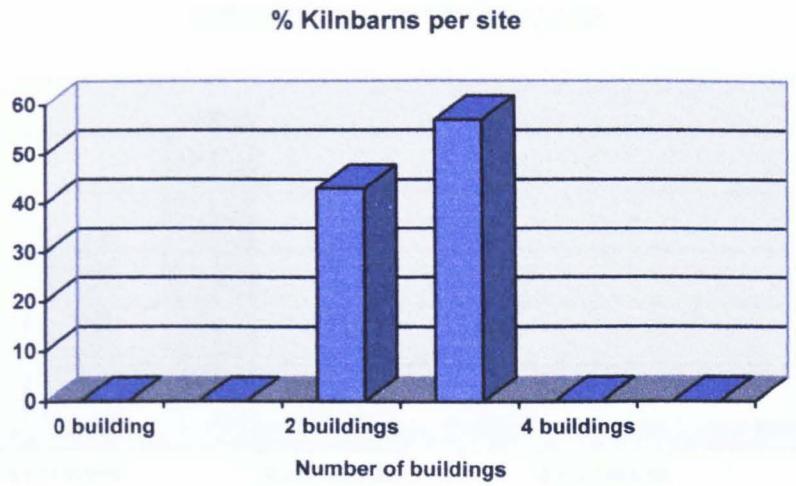

Figure 5.3: Percentage kilnbarns per site

The relationship becomes much clearer now, the 2 and 3 buildings per site categories dominate the resulting graph (see fig 5.3 above). Taking the results from both graphs (figs 5.2 & 5.3) it becomes quite clear that kilns are usually associated with sites of 2 or 3 buildings. Whether this is a true reflection of the structure and form of the social unit, or if we are witnessing a certain degree of lack of survival and in actual fact all kiln sites were of the 3 building category is unclear at the moment, however I intend to come back to this point later.

If we move away from kiln sites for the moment, and concentrate on associated enclosures, a series of graphs have been developed which relate the number of enclosures to the number of buildings per site (see figs 5.4 to 5.7). The question now becomes:

On sites which have associated enclosures, how many buildings are present ?

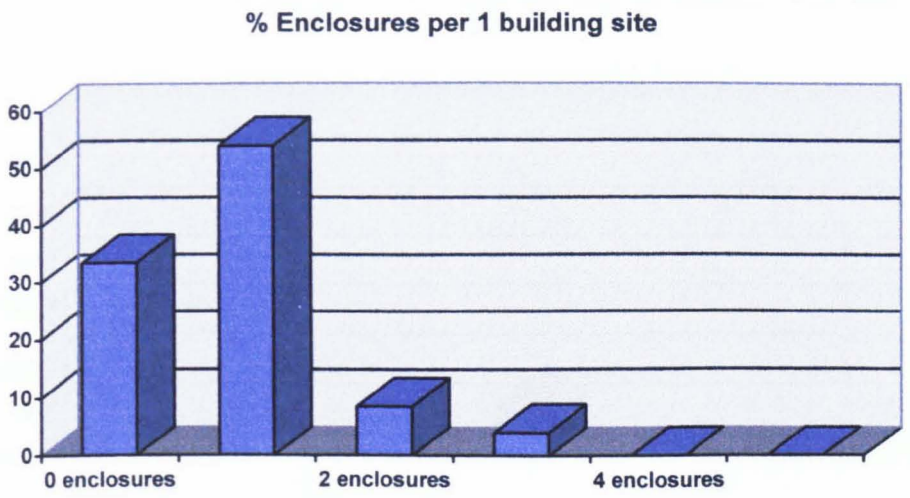

Figure 5.4: Percentage enclosures per one building sites

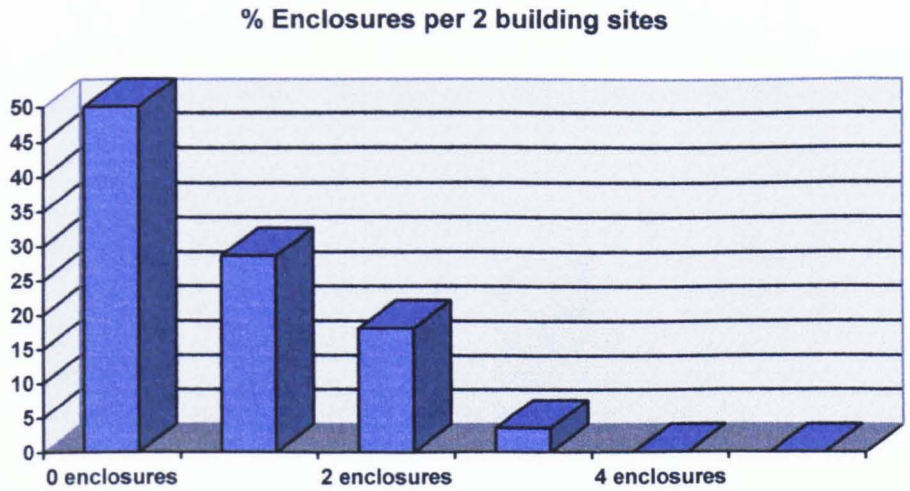

Figure 5.5: Percentage enclosures to two building sites

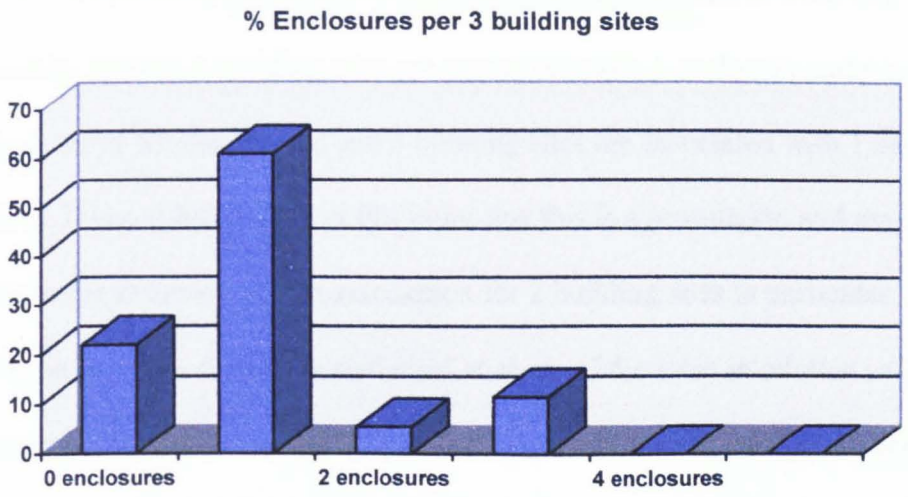

Figure 5.6: Percentage enclosures to three building sites

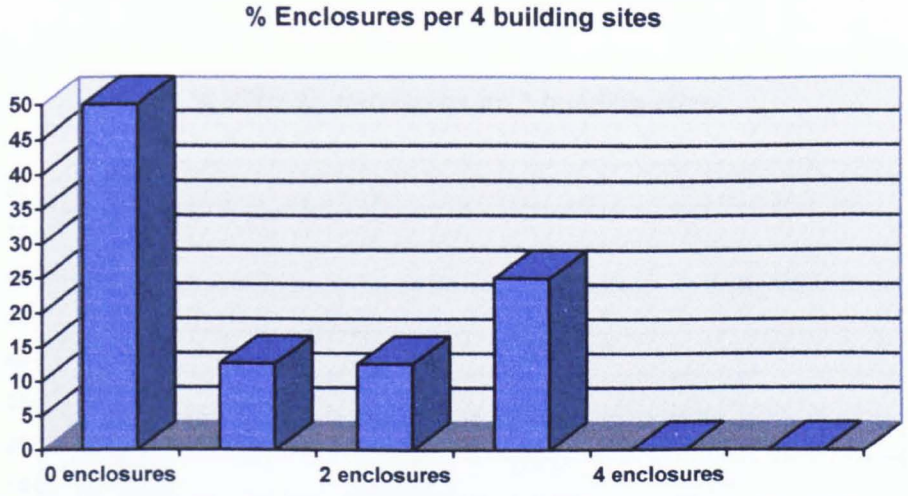

Figure 5.7: Percentage enclosures to four building sites

A relationship is evident here, with the possible development of two classes of site being inferred from the statistical analysis. Graphical representation of the 1 building category of site seems to suggest that over 50% of these sites are specifically related to 1 enclosure. Likewise the 3 building sites also appear to have a clear link to single enclosures (60%). Neither 2 or 4 building category sites have this profile, therefore it

is postulated that the structure of two types of site may be inferred from this relationship. That is, 1 building sites are associated with 1 enclosure and possibly no kilns (see above for discussion) and 3 building sites are associated with 1 enclosure and a kiln. It has to be stressed at this point that this is a postulation and may be contrary to the evidence of kiln association for 2 building sites in particular. This can only be confirmed or denied by statistical analysis of the kilns in relation to the enclosures per number of buildings per site. Therefore the next question becomes:

On sites which have associated kilns and enclosures, how many buildings are present ?

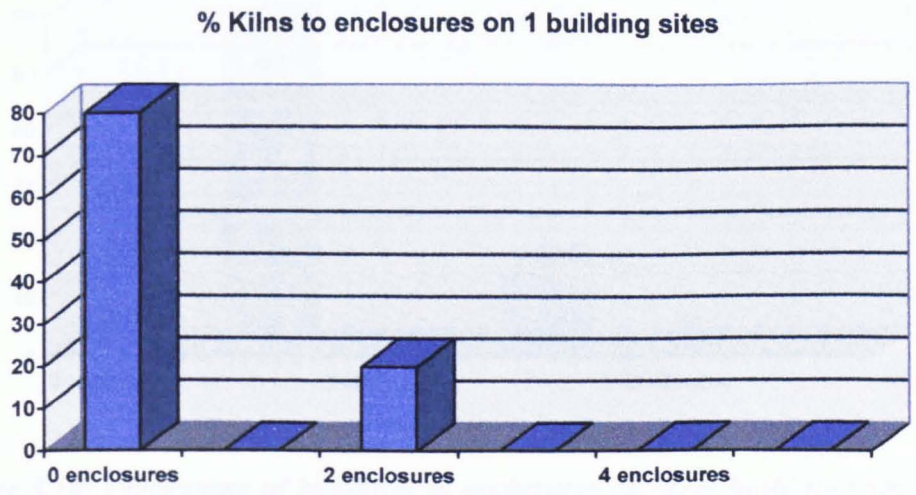

Figure 5.8: Percentage of kilns to enclosures on one building sites

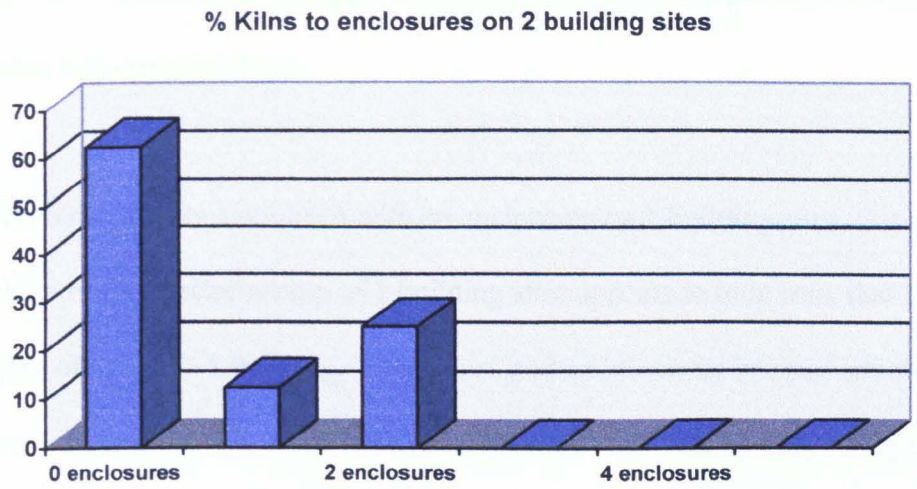

Figure 5.9: Percentage of kilns to enclosures on two building sites

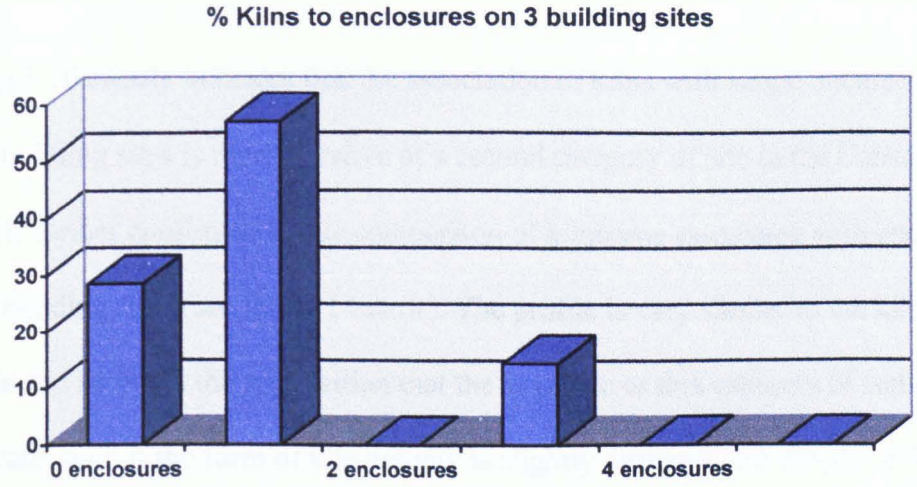

Figure 5.10: Percentage of buildings to enclosures on three building sites

The analysis of kilns associated with enclosures on 1, 2 & 3 building sites is crucial in the assessment of the validity of the material drawn from the database. In order to allow the full impact of the graphs to be felt they have been presented together (see figs 5.8 to 5.10 above). As the number of kilns to no enclosure sites drops the number

of kilns on 1 enclosure sites rises, as the number of buildings per site increases. This indicates two crucial things:

1) With 80% of kilns associated with no enclosures on 1 building sites, this confirms that the postulated relationship of 1 building sites appears to hold true, that is a category of site with 1 building, 1 enclosure and no kiln as its internal structure would appear to be present within the remains in Carrick. A secondary supporting element to this is the possibility that figure 8 supports the theory that the reason for the relatively high showing of kilns to 1 building sites in fig 5.2 could well be a result of differential survival of buildings.

2) Fig 5.10 clearly indicates that the association of kilns with single enclosures (57%) on 3 building sites is representative of a second category of site in the Carrick region. This is further confirmed by the comparison of kilnbarns associated with enclosures on 3 building sites (see fig 5.11 below). The profile is very similar to the kilns as a whole and supports the supposition that the structure of this category of settlement is accurate, even if the form of kiln activity is slightly different (see chapter 4 for further discussion of kiln technology).

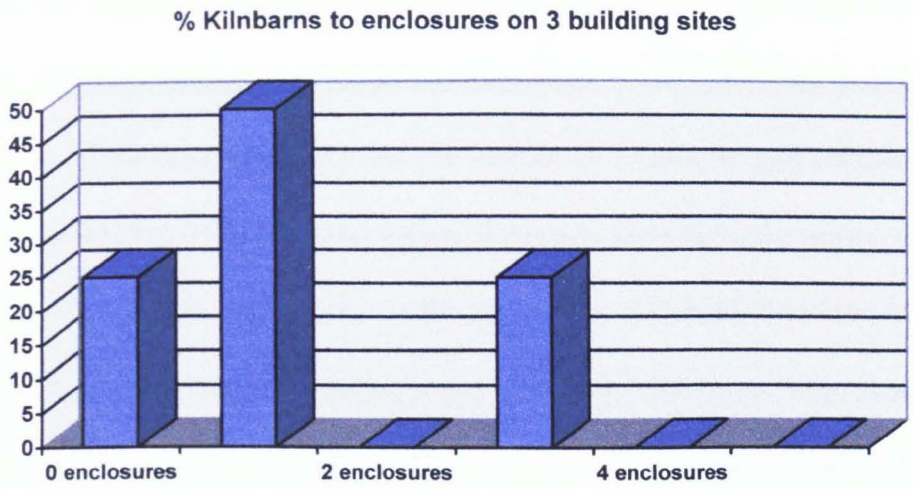

Figure 5.11: Percentage kilnbarns to enclosures on three building sites

As a final point Fig 5.9 seems to confirm that the association of kilns with single enclosures on 2 building sites does not represent a clear relationship. In fact over 60% of the kilns on 2 building sites were not in association with enclosures. For the 12% of these sites which have an enclosure then the differential survival argument put forward above may be applicable, however it is difficult to find wholehearted support for the 60% of no enclosure sites within that argument. What they represent will need to remain as surmise for the moment. Although this may simply be a statistical anomaly, as only eight sites fell within this category in total, therefore the percentage relationship may appear exaggerated.

This analysis of the Carrick sites tends to paint a very specific picture that two categories of site are evident within the Carrick dataset: type 1, sites with three or more buildings tend to have an enclosure and a kiln or kilnbarn associated with them, whereas type 2, the single structure with one enclosure and no kiln also stands out as a separate category. If we take the type one category first, this is an interesting result

which matched against the results of the RCAHMS elsewhere in Scotland, notably in Waternish, Skye and the Strath of Kildonan, Sutherland. It implies a very structured form in terms of the community unit and the number of longhouses and ancillary buildings to individual kilns. A closer look at the results introduces the notion that the structure of settlement in Carrick may be the same as the structure of settlements in north-west Skye. Piers Dixon has noted that at Waternish "individual longhouses tend to have a range of ancillary buildings and an enclosure, with an association with either corn-drying kilns or kilnbarns being sometimes present" (RCAHMS 1993). This is very similar to the Carrick results and begs the question: does this represent evidence of a similar social structure ? Although Whyte has indicated his belief that "the character of agricultural units varied temporarily and spatially within Scotland, so farms of similar sizes could have similar social structures" (1983, 124) I think we need to be careful of jumping to conclusions; after all, two sets of data do not make a theory. Dixon has also indicated that in the Sutherland case the pattern is different with "groups of three or four longhouses often sharing a barn and a communal kiln" (RCAHMS 1993). Little in the way of statistical work has been published on the RCAHMS survey results to date, and we should therefore tread very carefully here. The second group of sites are also worthy of further discussion at this point. It is quite clear from the Old Statistical Account (1790-92) and from the survey data recovered by the Ordnance Survey in the 1850s that single longhouses and associated enclosures were a common feature of the late eighteenth to mid-nineteenth centuries in Ayrshire. The OSA evidence tends to support the idea of the second category of site as the homes of cottagers and shepherds. In Colmonell for instant in the early 1790s the then minister discussed the role of cottagers and herdsmen in the rural economy, he states

for one or two cows, etc." (OSA 1790-1, 88). However, these preliminary statistical results need to be viewed in relation to the fact that no chronological differentiation can be achieved at this level of analysis. In essence we are viewing two possible types of social structure which may have existed simultaneously or at some distance apart in time. To take this further we need to move to the second level of analysis, that is differentiation of form by field analysis.

5.4 Stage 2: Differentiation of form and structure by field analysis

Stage two of the methodology developed to assess the structure and form of MOLRS sites in South Carrick was the field assessment of the sites recorded by the RCAHMS in 1981. The field assessment was undertaken between May and June 1996 and covered the entire South Carrick area, including sites in Galloway and South Ayrshire; from the Galloway border in the south and east to the Stinchar valley in the north and the Ayrshire coastline in the west. Of the fifty-six sites noted by the RCAHMS nine were not visited for a variety of reasons, and three could not be located on the ground. The main reasons for not visiting sites were inaccessibility (Loch Goosey, Loch Dornal), destruction by forestry planting (Near Eyes Stank), refusal of permission (West Altercannoch) and identification as shieling groups, which lie outside the remit of this methodology (Barnvannoch 2, Laganabeastie Burn, Loch Hill, Mirren's Stone, Pinwhiskie). Of the three sites not located Balnowlart 1 and Balnowlart 2 are certainly the most puzzling. Both sites were located in a field on the lands of Balig Farm by the RCAHMS in 1981, and this is supported by aerial photographs from 1977 (see fig 5.12: CUCAP-CEM/61-5). However field inspection did not reveal traces of either

and discussion with the farmer indicates that he had no knowledge of sites in that area. It may be that the quoted grid reference was inaccurate for the locating of these sites. The last site which was not located was the site of Dornal. Field inspection revealed that the area had been heavily planted by forestry in the recent past and in consequence no sign of the site was identified. In all 46 sites were visited, including a new site identified by West of Scotland Archaeology Service at Craig Farm (NX 168 871) and the recognition that Darnarroch represents two sites and should be dealt with separately.

The methodology of assessment was focused on site inspection, recording by field notes, sketches and occasionally photographs. The number of structures involved was checked and the dimensions of all structures taken together with other relevant evidence (i.e. number of compartments, position of entrance, alignment, height OD etc.). Prior to the integration of survey results into the stage 3 database (see below), a visual categorisation of the sites was developed based on form and layout of the settlement cores. In order for sites to fall into categories they needed to represent certain constructional forms or plan layouts and/or the use of particular building materials. The intention being to assess the results of the visual survey against the results of stage 3, the statistical analysis of structure and form. Five main categories of site were identified during this phase and a sixth category for sites which did not conform to any particular form or structural traits. These have been developed below along with gazetteers of the type sites.

File	OS NX08SE	St	region	county Ayrshire
date 7	NGR	Ky	district	

no. name BALNOWLART

Farmstead 1 NX 095 832 Farmstead 2 NX096 833

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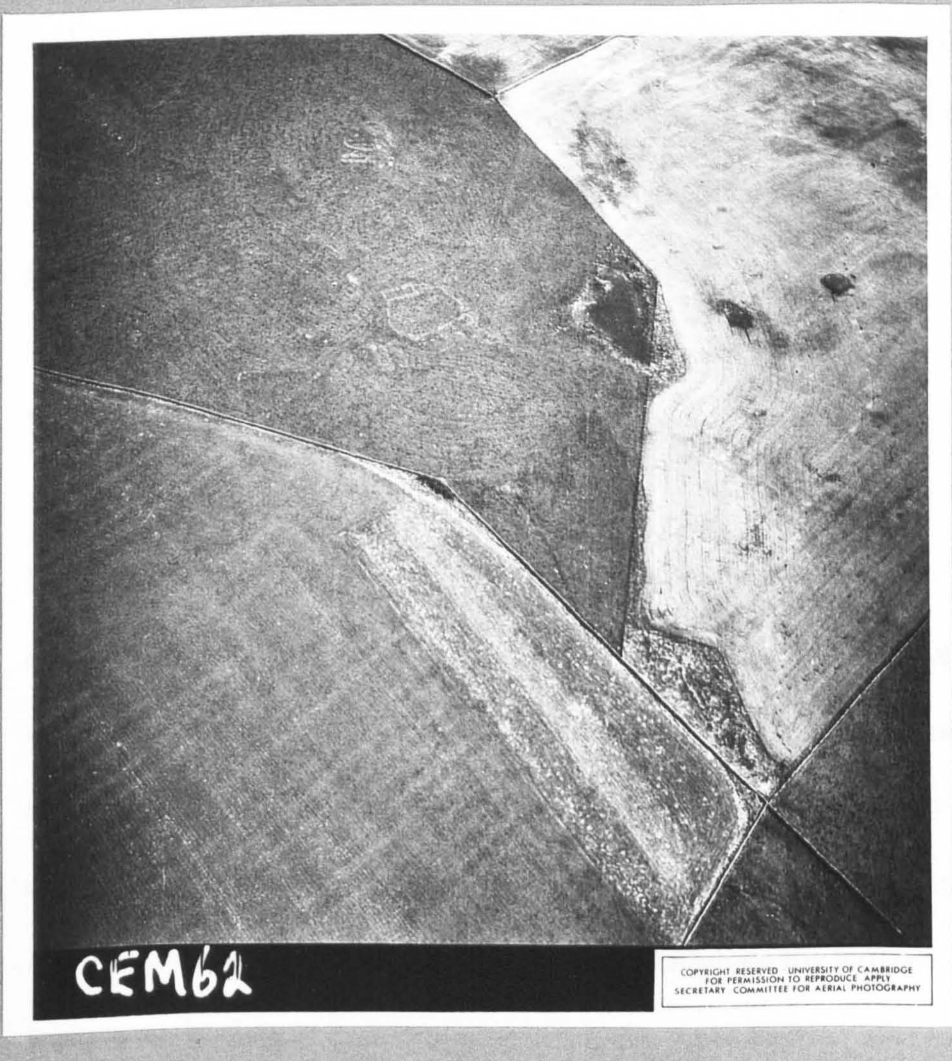

Figure 5.12 Aerial photograph of Balnowlart townships (source: RCAHMS)

Type 1 Sites: These sites are characterised primarily by the existence of low turf covered longhouse structures which have two compartments on split levels and no visible sign of entrances within them. Although the majority are single building sites with associated enclosures, examples were identified where associated buildings, enclosures and kilns were present. There were also a number of examples where type 1s had latterly been redeveloped into other forms (see discussion below for examples and debate). There were 10 of the type 1 sites identified during the field assessment phase, including the sites of:

1.1 Balig (NX 092 840) 35m OD

Balig is located to the north-east of the modern farm of the same name. The site is constituted by one long building and two associated enclosures. Structures are evident as low turf covered footings with the long building lying adjacent to, and outwith the northern enclosure. The long building is c. 17m by 4m in size internally with two compartments 8m long internally. The building lies in a east to west alignment cut into a natural knoll, the eastern compartment characteristically terraced above the western on the slope.

1.2 Old Park of Gleick (NX 058 718) 160m OD

Located high up on the edge of a steep seaward terrace looking over Loch Ryan this site was constituted by three buildings, two enclosures and a kiln some 45m to the south. The main rectangular structure lay in an east to west alignment and was c. 17m

by 4m with no sign of an entrance. It has two compartments, the upper of which is 6.5m by 4m and the lower is 8m by 4m in size. The long building has been terraced into the upslope. A later addition to this structure 6m by 4m was added to the western (downslope) end during its use. The third structure lies perpendicular the long building at its eastern end. This building is 5m by 3m internally. All the structures on the site including the enclosures were constructed of low turf banks with the long building lying on the outside of the main enclosure, though internal to the disrupted secondary enclosure, which appeared to interfere with the primary enclosure. The relationship was too indistinct to clarify the chronology though. The long building was cut into the upslope and sloped down to the second compartment which was terraced below it. A fourth possible building was located within the secondary enclosure and represented by a platform arrangement. The settlement of 'Glaick' appears on the maps of Pont (1654) and Armstrong (1775), "but does not appear on later maps" (RCAHMS 1981, 28).

1.3 Balnowlart Hill (NX 101 835) 55m OD

Located on a terrace this site is constituted by one long building and an associated enclosure. The long building is 16m by 3m and appears to be made of turfed over stone. It has a central dividing wall 8m in from the west, aligns in an east to west orientation and shows the characteristic stepped division between the two compartments. There is no evidence of an entrance. A possible corn drying kiln (mound variety) is visible on a small knoll above the site and two small squarish structures were noted on a second mound some distance to the north-east of the core.

Both structures were 4m by 2m in size and lay in a L-plan formation. Aerial photographs of the site show a highly complex field system around Balnowlart Hill and traces of what may be a secondary building lying perpendicular to the longhouse (see fig 1.4: RCAMSAP AY 4233-36). No traces of this secondary building were witnessed on the ground.

1.4 Barwinnock (NX 306 772) 120m OD

The site is located at the foot of the eastern flank of a natural terrace. It comprises two long buildings which lie side by side and a possible third which lies perpendicular to the group. An enclosure is present to the south-west of the buildings and lazy bed cultivation traces were witnessed to the south of the main long building. The main structure lies in a south-west to north-east orientation with entrances on the south-west wall. The upper portion of this building is characteristic of the stepped compartment variety of construction, being 21m by 4m in size, with the upper compartment terraced into the upslope of the natural slope. A third compartment (11m long) has latterly been added to give an overall length of 31m by 4m internally. The second structure lying parallel to the main building is a single compartment building 17.5m by 4m in size with an entrance in the south-eastern gable. The possible third structure is very ephemeral, but would appear to lie perpendicular to, and at the end of structure two, somewhere in the order of 7.5m by 3m in size. There was no trace of the rectangular platform, "possibly the site of a building" (RCAHMS 1981, 24) at 120m to the south-west of the main group.

1.5 Barwinnock Hill (NX 311 770) 130m OD

This site is located on a terrace on the eastern flank of Barwinnock Hill. It comprises three rectangular buildings which have been obscured in the recent past by the dumping of field clearance stones. The main structure lies in an east to west alignment with probable entrance in the south wall. This building has the characteristic stepped profile of category one sites (15.5m by 4m), with the upper compartment dug into the upslope (5.5m by 4m) . The main enclosure at the site comes off of this building to the north. The second structure lies perpendicular and to the south of structure one. This is 18.5m long by 4m wide and has three compartments, the northern and southern of which are 6m long and the central one is 5m long. Entrance is likely to be from the downhill eastern end, though the ephemeral nature of this building does not make this certain. The third building of the group lies to the south of building two and is also aligned east to west. This structure is 10m by 5m and has a single entrance in the southern wall. The first series Ordnance Survey coverage indicates that this site was "ruinous by 1855" (RCAHMS 1981, 24).

1.6 Cammock Burn 160m OD

Sitting astride a small knoll on the edge of a terrace to the west of the Cammock Burn this site is represented by one rectangular building and a surrounding enclosure. The building is aligned south-west to north-east with a possible entrance in the south-western wall . It has two compartments each of 7m length and has the characteristic stepped arrangement. The enclosure shows substantial traces of cultivation, as does

the surrounding area. A possible second structure was noted c. 30m to the south in amongst the forestry plantation. A good candidate for a corn drying kiln was also located on a second terrace approximately 100m to the south of the site. The site is alternatively noted as 'Dawhine' (Armstrong 1775) and 'Dawan' (Thomson 1828), but "was depicted as ruinous on the first edition of the Ordnance Survey 6-inch map" (RCAHMS 1981, 24)

1.7 High Altercannoch 1 (NX 248 811) 100m OD

The site of High Altercannoch 1 lies approximately 300m to the north-west of the current farmhouse tucked behind a natural knoll. One long building and an associated enclosure were evident, though a platform to the east of the building may be suggestive of further structures at the location. The long building is 13m by 4m in size, with the upper compartment (7m long) being dug into the upslope and stepped down into the lower compartment. No evidence of an entrance was witnessed, however the eastern gable was almost completely missing. The enclosure was apparent to the south-east of the structure.

1.8 High Altercannoch 2 (NX 244 807) 140m OD

The site sits high above the village of Barrhill on the edge of the moor some 600m west-north-west of High Altercannoch Farm. The site is constituted by two rectangular buildings which lie in a north-west to south-east alignment. No evidence of entrances were visible in either structure and only slight stepping of compartments

was apparent. The main structure is 9m long by 3m wide and the second structure 7.5m long by 2.5m wide. Turf would appear to be the constructional material in both cases. Slight traces of the associated enclosure mentioned by RCAHMS were noted to the south-east.

1.9 Kilbride Knowe (NX 243 876) 130m OD

This site sits at the foot of Kilbride Knowe on the valley floor adjacent to the Muck Water. It is very compact in nature, centred along a middle access track with structures on either side. Four buildings were identified at the site and an associated enclosure. The main long building, orientated on a east to west alignment is 24m long by 4m broad and shows the typical arrangement of a type one stepped dual compartment structure which has been altered subsequently into a three compartment structure. The eastern end of the building which has been dug into the upslope is 10m in length, stepping down to a 6m long compartment, then a 7m long compartment on the same level. It was unclear whether the lower compartments had formally been one single compartment or not, though this is quite likely. Entrances were apparent in both compartments within the northern wall. The second and third buildings lie directly across the access track from building one to the north. Building two lies slightly above building three but is clearly a separate construction 11m by 4m in size. A single entrance to this building exists in the southern wall. Building three is 6.5m long by 4m broad and also has an entrance in the southern wall. The fourth building on site lies within the enclosure to the east of, and perpendicular to, the main group. This structure is 8.5m long by 3.5m broad. Constructional materials are turf over stone for

all components of the complex. The enclosure dyke has been latterly overlain by a drystone boundary dyke along the edge of the Muck Water. Depicted as a ruin on the first edition series (OS 1855), Armstrong's map (1775) "notes only the place-name of Kilbride" (RCAHMS 1981, 26). However, both Pont (1654) and Roy (1747-55) record the settlement as 'Kirbride' and 'Kirkbryd' respectively.

1.10 Lochton Hill (NX 138 873) 130m OD

The remains of this site are positioned high up on top of a terrace to the south-east of Lochton Hill. Traces of three rectangular buildings and an associated enclosure with cultivation ridges are present. The main building in the group is 9m long by 3m broad with a small circular structure appended to the western end (2.5m by 1.5m). The structure appears to have a slightly stepped dual compartment nature, though stone robbing and clearance dumps within this and the other buildings has tended to obscure elements of the site. The main building lies east to west, but no evidence of an entrance was visible. The second building lies in a north to south alignment 8m long by 3m wide, is a single compartment with no sign of an entrance visible. The third structure was the poorest surviving of the group, approximately 9m long by 4m broad it lay in an east to west alignment. The enclosure was located to the south of the main group. "It may be recorded as 'Craigcar' on Thomson's map of 1828 but does not appear on earlier maps" (RCAHMS 1981, 27). Though it had clearly been abandoned by the time of the Ordnance Survey first edition series (1855).

Type 2 sites: This form of site is characterised by drystone-built structures which are generally aligned in a linear manner facing onto each other with a central access track clearly visible. Their state of preservation tends to be good with courses in some cases as high as 1.5 m. Association with kilns and enclosures are a common feature, as are substantial field systems.

2.1 Mark, Glen App 1 (NX 078 743) 160m OD

This site sits high up on the edge of a terrace above the Glen App valley. It comprises six rectangular buildings with evidence of both turf and drystone construction, an enclosure to the east of the settlement core and a corn drying kiln some 40 m to the east of the main group. The main group of structures are aligned along a central access track on a north-west to south-east orientation with subsidiary structures to the east and west of the core. A possible seven structure was identified to the north-west of the main group on the exterior of the enclosure, however this is by no means certain. Along the western side of the access track the main structure (drystone-built) is a single compartment building 13.5m by 3m in size with a small compartment tacked on to the southern end (2.5m by 3m). Both have entrances onto the access track. To the north of this building a small turf building has been appended (6m by 3m) on a slightly different alignment. Opposing this group are two single compartment structures. The first (southerly) is 7m long by 3m wide and the second (northerly) is 8m long by 3.5m wide. This latter structure may also have an opposing door leading out into the enclosure. To the south of the settlement core another structure was

visible which was also in a north-west to south-east alignment. This turf over stone-built structure was 12m by 4m and exhibited a short length of drystone walling which cut off a small ante-chamber from the main compartment (which was 9m long). The entrance would appear to have been located on the western wall to the north of the structure. The final structure noted at the site lay to the east of the main group and was constituted by a turf building 4m by 4m attached onto the end of a boundary dyke. There was no visible entrance. Although the site exists within an extensive complex of field systems and drystone pens and is clearly named 'Old Mark' on the first edition series (OS 1855) at which time it was ruinous, "it cannot be certainly identified with the farmsteads of High and Low Mark recorded on earlier maps" (Roys 1747-55; Armstrong 1775; Thomson 1828) (RCAHMS 1981, 27).

2.2 Macherqhuat (NX 107 843) 90m OD

This site was located high up on a south facing terrace at the foot of Knockdolian. It comprises five rectangular buildings, two enclosures and a corn-drying kiln and is surrounded by the remains of a boundary dyke (see fig 5.13). The site has the characteristic central access way onto which the main buildings lead. The enclosures stand either side of the access to the east of the site. The main access and two main buildings being aligned east to west. Structure one is a single compartment drystone structure with entrance on the north (access track) side (10m by 4m), whilst building two (12.5m by 4.5m) is a two compartment structure with both entrances to the south (access track side). This structures main compartment is 8m long. Structure three lies slightly to the west of structure two and is on a south-west to north-east alignment.

Figure 5.13 Aerial photograph of Macherquhat township (source: RCAHMS)

At 11m long by 3m wide it has one entrance in the south-western gable. The fourth building in the group lies slightly to the south-west of building three and lies in a north to south alignment (10.5m by 4.5m). It has two opposing doors in the east and west walls centrally located across the axis of the building. Buildings two, three and four are all connected together by short stretches of dyking. The final structure on site lies to the east of structure two and is appended to the northern enclosure dyke. It is 4m long by 5m broad and has an entrance in the south-western wall and is aligned south-east to north-west. It is depicted as ruinous on the first edition Ordnance Survey series and has since changed name to 'Macherwhat'.

2.3 Bellimore-on-Tig (NX 139 827) 100m OD

This site known as 'MacEwanston'(OS 1855) is located high up on the valley side on the road to Bellimore-on-Tig farm. The site comprises three rectangular long buildings set either side of a main access track, with faint traces of a possible fourth building on a platform to the north of the group and an enclosure to the south-west of the core. Satellite activity includes a turfed over building 60m to the north-east of the group and a maltkiln 100m south-west of the main group. Substantial field systems were also evident surrounding the settlement core and appear clearly on the aerial coverage of the site (see fig 5.14: RCAMSAP-AY 4245-9). The main building to the east of the access track is 8m long by a 4m broad with an entrance in the western wall. To the north of this a smaller structure is appended (5m by 2.5m) with no visible entrance. Lying immediately to the north of this are traces of a possible structure on a slight platform directly above the group (c 5m by 3.5m in size).

Figure 5.14 Aerial photograph of Macewanston township (source: RCAHMS)

Opposing these buildings on the western side of the track lies a one compartment structure (10m by 4m) which may have an entrance on the north-western corner of the building. This building also appears to have a secondary chamber to the north (4m by 4m) though it is quite ephemeral in nature. The site is "depicted as ruinous on the first edition Ordnance Survey 6-inch map" (RCAHMS 1981, 24).

2.4 Balsalloch Hill (NX 123 886) 130m OD

Located on the southern flank of Balsalloch Hill this site was constituted by three rectangular buildings, two of which are positioned across a main access track. The main grouping is aligned east to west, with traces of a enclosure to the north of the grouping. The northern structure is divided into two compartments with entrances facing south. It is dug into the upslope along the northern wall and extends for 17m internally by 4m broad. At the eastern end a short (5m) stretch of walling was apparent, however it was unclear whether this represented a further compartment or merely a dyke. The western compartment was 6.5m long with a partial wall (4.5m from the west) cutting across the compartment. In the north-western corner a later lambing pen had been added. Directly across from this building lies building two, which extends 19m long by 4.5m broad. This building is divided into three compartments which are terraced slightly below each other running down the slope to the east. The upper compartment (5m by 4.5m) appears to have two entrances, one in the southern wall and one in the eastern dividing wall. The middle compartment (6m by 4.5m) has three entrances, one in the northern wall and possibly a second opposing entrance in the southern wall and an entrance in the dividing wall leading into the

western compartment. The third and final compartment to the east is 6m long by 4.5m broad and has one entrance to the north onto the access track. The final building in the group lies to the south-west and is aligned south-west by north-east. This building (11m long by 4.5m broad) is a single compartment and has opposing doors to the north-west and south-east. The constructional materials are drystone which has become partially turfed over. There is evidence of substantial field systems in the area and what appears to be a hut platform (prehistoric ?) some 34m to the south of the main cluster on the edge of the terrace. The site was abandoned before 1855 (OS), "but may be the 'Carletonhill' of Thomson's map of 1828. Pont's map (1654) records 'Kartounhill', but the name does not appear on the maps of Armstrong (1775) and Roy (1747-55)" (RCAHMS 1981, 23).

2.5 Clauchrieskaig (NX 321 853) 210m OD

The site of Clauchrieskaig is located deep within a modern forestry plantation overlooking the river Cree. The site comprises the remains of three rectangular structures aligned along a main access track on a north-east to south-west orientation. Forestry planting has occurred in very close proximity of the core and the remains of the corn drying kiln "adjacent to rig and furrow cultivation" referred to by the RCAHMS in 1981 (25) can no longer be located. The main group of structures are very characteristic of this form of site, with walls standing to over 1m in some places. The first structure lies to the north-west of the access track and is a two compartment building which extends 21m long by 4.5m broad. It has a separate access to both compartments on the south-eastern wall, with the remains of a later lambing pen

evident in the south-western corner of the south-western compartment. Structure two lies directly across the access track from this and is a three compartment structure 20m long by 4m broad. All compartments have one access each on the north-western wall. The south-western compartment is 6m by 4m in size, while the middle compartment is 5m by 4m in size and finally the north-eastern compartment is 7m by 4m in size. To the rear of this building a short stretch of dyking leads to the final building in the group which is aligned north-west to south-east. This structure is a single compartment with one access in the south-west wall. "It was recorded on Thomson's map in 1828, but was abandoned by 1855 (OS first edition)" (RCAHMS 1981, 25).

2.6 Half Merk (NX 275 853) 200m OD

The site is located on top of a brae which is now in a modern forestry plantation clearing. The settlement consists of two rectangular structures and an enclosure aligned either side of a main access track on a north-east to south-west orientation. During the RCAHMS visit to the site in September 1981 a kiln and extensive traces of rig and furrow cultivation were also noted (26), however these features have been almost entirely lost to forestry since planting with the exception of a small area of cultivation remains to the east of the main group. Forestry ploughing has also impinged on the main group causing severe damage to the access track and structure two. The Ordnance Survey also show a larger enclosure encircling the group which is still visible and can be traced on the ground through the trees. Structure one on the site is 18m long by 4m broad and sub-divided into two compartments running up the

slope. The upper compartment is 6m by 4m and has traces of a later lambing pen in its eastern corner, whereas compartment two (the lower) is 10.5m by 4m in size. Both compartments have entrances on the north-west wall. Structure two lies directly across the access track and is 7.5m by 4m in size. There is no visible entrance, though two later lambing pens are visible in the northern and southern corners. Thomson (1828) records the site which was abandoned before 1855 (OS), however "the maps of Pont (1654), Roy (1747-55) and Armstrong (1775) all depict a settlement of this name though none can be certainly identified with this site" (RCAHMS 1981, 26).

2.7 Kilbride Knowe (NX 243 876) 130m OD

See section 1.9 for full discussion of this site.

2.8 Laigh Dangart (NX 174 860) 120m OD

The site of Laigh Dangart lies c 350m south-south-east of the current farmstead of the same name on a terrace above the Stinchar Valley. The main cluster of four building lies in an east to west alignment and is divided by a main access track and what may be a secondary track coming off perpendicular to this (see fig 4.3). Recent agricultural ploughing has eradicated all signs of the extensive field systems witnessed by the RCAHMS in September 1981 (26). The site has suffered from dumping of field clearance stones and is further obscured by dumping of burnt gorse bushes (particularly on top of structure four). Structure one on the site lies to the south of the group and comprises a four compartment building 26m long by 4m broad. The upper

compartment (i.e. eastern) is 4m by 4m with an entrance onto the access track (north), while the second compartment is 5m by 3m and has an entrance in the southern wall. The third compartment is the largest (12m by 4m) and also has an entrance in the southern wall, whereas the fourth compartment has not survived very well with only a portion of walling visible, though it would appear to be 3.5m by 3m in size. Structure two lies directly across the track from one and is an open ended structure which has a tapered northern wall. Tapering from 3m wide at the back wall (east) to 4.5 m wide by the side access track (west) and 4m in length. It Is likely that this represents a larger building which has been latterly truncated to make a side access track perpendicular to the main access track. Structure three lies to the west of this building and is also partially obscured by dumping. At 7.5m by 3.5m it has an appendage to the west which has an entrance in its western wall (3m by 2.5m). At the eastern end of the structure a small chamber was evident (2m by 3m) which had become filled with clearance material. The reason for this was unclear. There was no sign of an entrance on the southern wall, but it may be possible on the northern wall. The fourth and final building on the site lay to the north of the group and was severely obscured by burnt gorse. The extent of material dumped within the structure meant that no coherent interpretation of the building was possible.

Type 3 sites: Sites which have been characterised type 3 tend to be represented by small drystone built single buildings associated with single enclosures. These sites tend to have survived well with courses generally in the order of 1 m in height. They are single compartments with one entrance within them.

3.1 Mark, Glen App 2 (NX 077 743) 160m OD

Located to the west (c 90m) of Mark, Glen App 1 (see section 2 above) this site lay on the hillside terrace above Glen App. The site comprised a single compartment drystone built structure (8m by 3m) in a north to south alignment with an entrance in the west wall. An associated enclosure was also present.

3.2 Davy's Hill (NX 068 747) 230m OD

Situated high above the Glen App valley on the opposite hillside to the Mark, Glen App sites (sites and 2.1 and 3.1) this site consists of one rectangular building dug into the hillside. The building is of drystone construction and has an entrance in the north-east gable. Aligned north-east to south-west the site is accompanied by a large enclosure with cultivation ridges present and a circular structure appended to the south-west of the building. It would appear that the rectangular building post-dates the circular structure (6m in diameter) which has an entrance in the western wall.

3.3 Barjarg (NX 319 782) 150m OD

The site of Barjarg sits on the south-east flank of Barjarg Hill. It comprises one drystone built rectangular building, two scooped enclosures (one of which has hay rick bases in it) and an associated field system. The building is aligned north-west to south-east and has an entrance in the south-west wall. It is 13m long by 4m broad and has become partially turfed over.

3.4 Barnvannoch 1 (NX 140 740) 210m OD

This site is located high up on top of a knoll c 600m north-east of the current farmhouse. It consists of one rectangular structure and an associated enclosure. The structure is 8m by 4m in size, is aligned north-west to south-east and has an entrance in the north-eastern wall. The building materials would appear to be drystone which has latterly been turfed over. There is strong evidence of pitting and associated banks to the south-east of the site, though it is very unclear what this represents.

3.5 Clauchrierob (NX 312 847) 190m OD

The site sits on a cleft below a natural hillock facing south into Galloway. Two structures were present, though they represent separate phases of use. The main structure on site is 11m long by 4m broad and lies in a north to south alignment. Although it would appear to be a one compartment building with entrance in the east, traces were evident of a possible dividing wall and what may be a central drain in the

southern portion of the building (running to the north of the south gable for c. 6m). A later lambing pen was also present in the north-west corner of the building. Accompanying this building were two small enclosures terraced one above the other; both showed clear traces of cultivation ridges. To the north of the site and overlain by the upper dyked enclosure was a single turf building (9m by 4m) with no visible entrance. A portion of earthen dyke ran off this structure to the north-west. The site was abandoned by 1855 (OS first edition).

3.6 Darnarroch 1 (NX 241 755) 170m OD

The site sits on the side of Darnarroch Fell and comprises one rectangular building and two associated enclosures, each showing traces of cultivation ridges (see fig 5.15). The building is 10m long by 3m broad with no visible entrance, though a second appended structure may be visible to the south-west of the building (c. 6m by 3m). The building is aligned south-west to north-east. The site appears to be constructed of turfed over stone and "was ruinous by 1855" (RCAHMS 1981, 25). Darnarroch appears on Thomson's map of 1828.

78 DARNARROCH

DESERTED FARMSTEAD

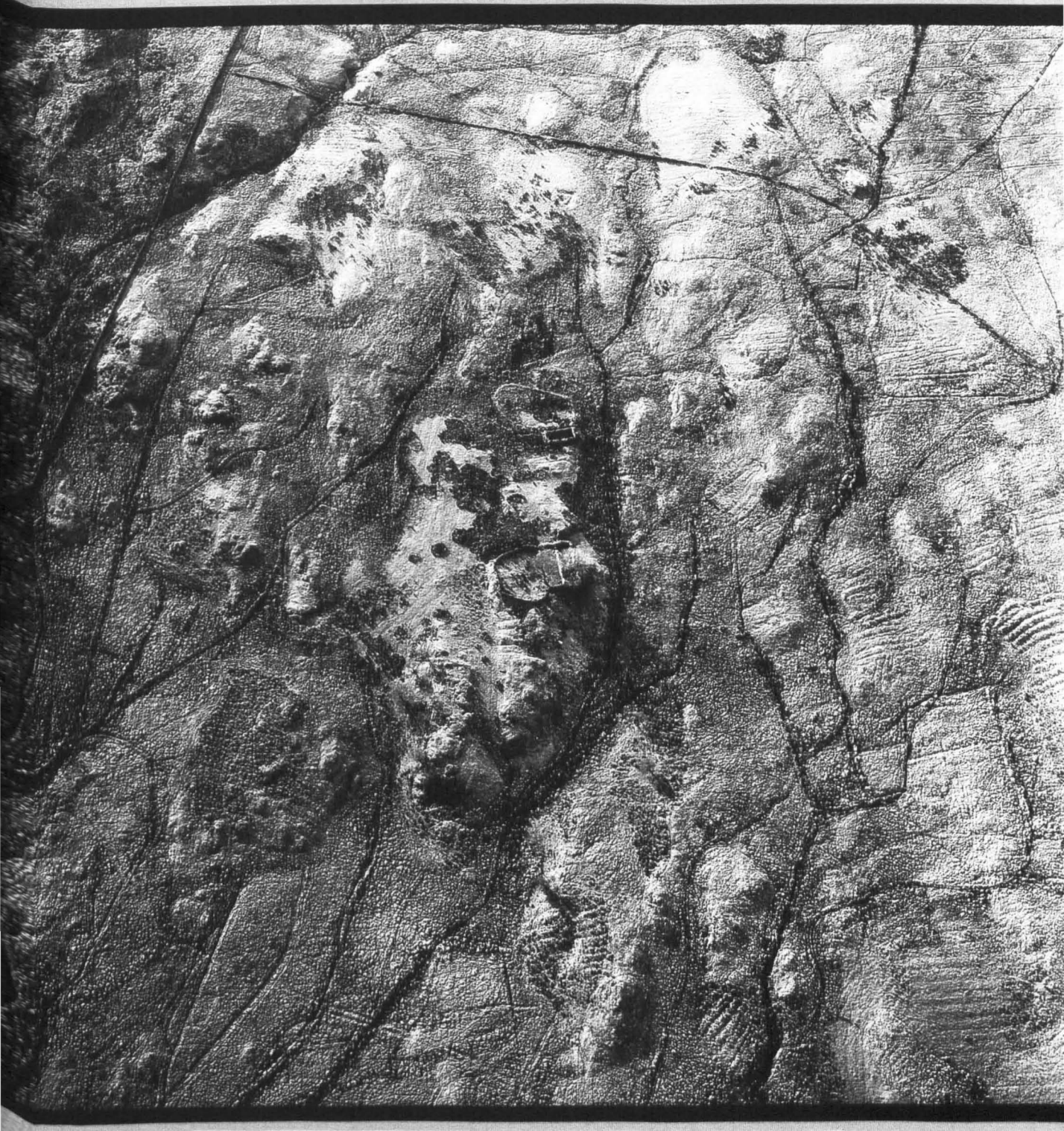

Figure 5.15 Aerial photograph of Darnarroch township (source: RCAHMS)

3.7 Glenour 1 (NX 182 827) 190m OD

The site is located within a clearing in a modern forestry plantation and consists of a single drystone built rectangular structure (10.5m by 4m) and an associated enclosure. The building is aligned north to south and has an entrance in the west wall. A second structure was identified on the site to the south-west of the building. It would appear to be a small drystone lined hut (3m by 2m) built into a natural knoll. This is likely to be the kiln referred to by the RCAHMS during their visit in July 1981 (25). The site was abandoned before 1855 (OS first edition). It seems unlikely that this represents the site of 'Byne' (Armstrong 1775; Thomson 1828) or 'Bane' (Roy 1747-55) as the RCAHMS suggest. This is much more likely to be the site of Glenour 2 (see section 6).

3.8 Mark (NX 252878) 170m OD

Lying above the Muck Water on a small spur to the east of Mark farmhouse this site comprises one rectangular building and an associated enclosure. The building has two compartments and lies in an east to west alignment with two entrances in the northern wall. It is 13m by 4m in size with the first compartment being 8m long. It is turfed over stone construction and exhibits a flat platform to the south-west of the building which may indicate the site of an earlier/associated structure. A small area of rig and furrow cultivation was also discernible.

3.9 Moak Hill (NX 141 874) 90m OD

The site was located at the foot of the southern flank of Moak Hill and consists of one rectangular building (9m by 4m) with no sign of an entrance and traces of an associated enclosure. The structure was aligned north to south and appeared to have a small open ended appendage (3m by 4m) added onto the north of the building. A possible second turf-built structure was identified on the edge of the burn to the south of the main building dug into the upslope. This is by no means certain however.

3.10 Darnarroch 2 (NX 241 755) 180m OD

The site of Darnarroch 2 lies in close proximity to Darnarroch 1 on the side of Darnarroch Fell. It comprises one rectangular structure and an associated enclosure, with further cultivation traces in the surrounding area (see fig 5.15). "Abandoned between 1855 and 1894" (RCAHMS 1981, 25), this site may be related to Darnarroch 1 which is located 50m to the north-east. The building is 5m long by 3m broad and lies in an east to west alignment with the entrance likely to be in the southern wall. Turfed over stone would appear to be the constructional material. The cartographic evidence of the site is discussed further in section 3.6 above.

Type 4 sites: The characteristics which seem to delineate a different category for this type of site are more associated with layout than constructional differences. These sites tend to be spread out over substantial areas with field systems running between the key structures on the sites. Generally drystone construction is evident with multiple buildings, enclosures and kilns all present. Preservation is good with walls in some cases achieving wallhead height.

4.1 Airyewn (NX 224 755) 220m OD

The site is located high on a hillside within a clearing in a modern forestry plantation. Three structures were identified spread out over a substantial area (see fig 5.16: RCAMSAP 82-AY/4979-83). The site comprises rectangular buildings, one enclosure and a corn drying kiln 80m south-east of structure 1. Structure 1 was located at the top of the group which runs down the hill. This two compartment building built of drystone construction stands to wall height in the north-east gable. It is aligned north-east to south-west and has two entrances, one in the north-east gable and another in the north-west wall. It is 14m long by 3.5m broad, with the northern compartment 4m in length leading through an entrance in the dividing wall into the 6.5m long southern compartment. A later lambing pen has been added to the north-east corner of compartment one. The enclosure runs of the back off this structure. Building two lies some 83m east of building one and is once again a drystone construction built in two compartments, though the preservation is poor in comparison. This building lies in an east to west alignment and is 14m long by 4m broad, the western compartment is 7m long and the eastern compartment is 6m long.

Figure 5.16 Aerial photograph of Airyewn township (source: RCAHMS)

There is no visible sign of an entrance, though a small squarish construction exists in the north-east corner of the western compartment. A third building was located some 50m north-west of building two. This construction was obscured by undergrowth, though appears to be some 7m long by 5m broad, of turfed over stone build with an entrance in the south-eastern gable . It is aligned north-west by south-east. A possible fifth structure was located 25m north of building two cut into a natural knoll. It was circular in plan, approximately 1.5m in diameter and may represents an earlier kiln. Substantial areas of rig and furrow cultivation were witnessed around all structures on the site. "Airyewn is recorded on the maps of Thomson (1828) and Pont (1654)" (RCAHMS 1981, 23), but was abandoned by 1855 (OS first edition).

4.2 Chapel Croft, Killantringan (NX 260 808) 120m OD

Widely dispersed over a pasture field to the south-west of Killantringan Farm (approximately 170m) are the remains of this site. Three rectangular buildings were evident and a kilnbarn. Drystone construction would appear to be the building material in favour, though in most cases stone robbing has depleted the structures. Structure one, which is alternatively known as the Chapel Croft with its surrounding enclosure was excavated in the 19th century as a possible ecclesiastical site (see Chalmers 1887-1902, 542). However the results of the partial excavation "indicated that it was of secular character" (RCAHMS 1981, 24). The building is 11.5m long by 5m broad and has a possible entrance in the north wall. It is aligned east to west. Structure two is located to the south of this and is appended onto the outside of the enclosure wall. This building is 6m by 3m and is aligned south-west to north-east with

no visible sign of entrance. Building three lies to the north of, and perpendicular to, building one. Aligned north to south it is a single compartment 9m long by 3m broad with no visible sign of an entrance. The final structure on the site lies to the north-west of structure one and is probably the best preserved of the buildings at Killantringan. Overall it is 10m long by 4m broad, however it is divided into two compartments. The first compartment aligned south-west to north-east is entered by the north-east gable and is 4m long by 4m broad. At the entrance it appears to have a triangular upright stone with cup-markings on it. The second chamber is the bowl of the kiln itself, which is 3m in diameter.

Type 5 sites: These sites are characterised by their lack of rectangular structures and the prevalence of small sub-circular or oval buildings. Generally represented by low turf walls the structures dominate this category of site, although associated low turf banks were also evident at some sites. Preservation tends to be fair, though the low walling and ephemeral nature of the remains means that undergrowth can easily obscure their existence.

5.1 Cawan (NX 246 871) 190m OD

The site is located high on the moor above the Muck Water valley and is constituted by three dispersed oval structures built into mounds and a small squarish enclosure at some distance to the south-east (c.100m). All the buildings are heavily overgrown with rushes and are approximately 5m by 3m in size, though they appear to be of drystone-build which has latterly been turfed over. The enclosure is probably unrelated to the shieling group.

5.2 Chirmorie 2 (NX 205 770) 210m OD

The site sits below a natural knoll 400m north-west of the current farmhouse and appears to consist of two clearly visible oval huts and one not so visible hut. A fourth hut may be present and is visible as a small oval platform to the east of the group. The structures are approximately 5m long by 2m broad and show entrances in the west and south-west. The northern most structure may have a small internal division at its

eastern end. Short areas of earthen dyking are clearly visible coming off of the structures in the group. Construction material would appear to be turfed over stone.

5.3 High Altercannoch 3 (NX 245 805) 140m OD

This site is located on the edge of a cultivation terrace above Altercannoch Farm and consists of a series of low mounds with depressions within them which may possibly be rectangular structures or oval huts. The mounds are c. 5m in diameter, though heavy undergrowth prevented any clear analysis of form and numbers of structures present.

Uncategorised sites: A substantial number of sites were visited which could not be characterised as falling into one of the above 'type site' groups. These are listed below as type 6 sites for ease of discussion and referencing only.

6.1 Craigneil Hill (NX 141 843) 130m OD

The site sits on the side of Craigneil Hill facing south. Little remains of the core of the settlement and colonisation by gorse has confused things somewhat. Two sub-rectangular platforms are visible, the first is aligned north to south and is 10m by 4m in size. The second, aligned south-west by north-east is 7m by 4m in size. There is possibly a third to the east of the main group, aligned east to west which is 6m by 4m in size. "It is depicted as ruinous on the first edition of the Ordnance Survey map 6-inch" (RCAHMS 1981, 25).

6.2 Ballaird (NX 204 844) 120m OD

The site is located on top of a natural terrace above the Lig Burn and comprises one rectangular structure, a small square building , a possible kiln (39m to the south-east) and three large rigged enclosures. The long building is very ruinous, 23m long by 4m broad it appears to have had three compartments. It is aligned north-west by south-east and probably had entrances along the north-east wall, though stone robbing has effectively removed most of this wall. The compartment sizes running from the north-west to south-east are as follows, 6.5m, 6.5m and 7m in length. The second structure lies directly to the east of building one, it is partially turfed over drystone-build and is 4.5m by 3m in size. Known as 'Dounie' it appears on the first edition series (OS) as ruinous, "but does not appear on earlier maps" (RCAHMS 1981, 23).

6.3 Chirmorie 1 (NX 220 760) 200m OD

Site was located within modern forestry plantation. No attempt has been made to protect this site from ploughing or planting consequently it is all but totally destroyed. The RCAHMS make reference to an enclosure (1981, 24), but this can no longer be located, however the rectangular building is still partially visible. It would appear to be approximately 10m long by 4m broad and may have had two compartments, aligned north to south.

6.4 Craig Hill (NX 170 874) 180m OD

Site was located by RCAHMS in 1981 500m east-south-east of the summit of Craig Hill (25). No trace of the rectangular structure was located at the grid reference specified by RCAHMS, though traces of two enclosures were encountered.

6.5 Crongart (NX 269 822) 140m OD

The site was located to the north-east of Standard on a natural knoll facing the Feoch Bank Wood. It comprised three rectangular buildings in a tight group and an associated enclosure. Evidence from surrounding field systems indicates substantial stone clearance dumps and large scale drystone dyking activity. The main structure on the site was 8m long by 3m wide and aligned east to west with an entrance in the south wall. Lying directly behind this building and sharing the same wall was building two aligned north to south. This structure was 4.5m by 2.5m and had an entrance in the northern gable. Building three lay a short distance further north of this building and was also aligned north to south. Built into the drystone walling of the enclosure it had no visible entrance and two turf walls (c 5m by 4m in size).

6.6 Duniewick (NX 114 851) 120m OD

The site is located high up on the terrace to the west of Duniewick Fort, nestling behind a natural knoll and protected on its southern side by crags. The site comprises one rectangular building, areas of dyking (turf/stone) and a possible position of a

much denuded second structure. Aligned east to west and 6m long by 3m broad the building has an entrance in the northern wall. A level platform directly to the west of the structure may imply a second compartment in use at some time (c 5m long), though no walling was visible. Directly to the south-west of this building a possible second structure was evident (4m by 4m). Construction materials would appear to be turf/stone. At some distance to the south-east of structure one a small squarish building was encounter, constructed entirely of large undressed blocks of stone; it is unlikely that this was part of the original group.

6.7 Garna Burn (NX 144 877) 110m OD

Garna Burn is located on a small terrace to the south-east of Moak Hill and consists of two distinct phases of construction with five buildings present, a possible sixth and a kiln some 55m to the south-east of the group. Phase one is represented by two turf over stone buildings aligned south-east by north-west and overlain by a drystone dyke. The first structure is 10m long by 4m broad with no visible entrance. The second structure is 4m long by 3m wide and appears to have an entrance in the north-west gable. Phase two at the site is represented by two rectangular buildings, the first aligned north-east by south-west has an entrance in the south-east wall and is 12m by 5.5m in size, while the second is aligned south-east by north-west and is 5m by 4m in size. The entrance to the second building is in the south-west wall. Both the phase two buildings are of drystone construction. A sixth possible structure appears to be partially overlain by phase two, building two, and may therefore be contemporary with phase one buildings. It is approximately 6m by 4 m in size and may have an

entrance in the south-west wall. Known as 'Pinbraid' the site was ruinous by 1855 (OS), "though 'Pinbraid' or 'Pinbrake' are recorded on the maps of Thomson (1828), Armstrong (1775) and Pont (1654)" (RCAHMS 1981, 28).

6.8 Glenour 2 (NX 179 827) 190m OD

The site sits high up on a hillside above the valley floor within a clearing in a modern forestry plantation. It comprises the remains of three rectangular buildings and two enclosures. The main building on site is a two compartment drystone-built structure (10.5m by 5m) which lies in a east to west alignment running down the slope. The western compartment is 4.5m long and the eastern compartment 5.5m long. There is a possible third compartment to the west (approximately 2.5m long), though rubble has obscured this somewhat. To the east of the structure a small 2.5m addition has been added in turf. A later lambing pen was evident up against the northern wall in the eastern compartment. Entrance to the building is via a doorway in the southern wall. The second structure on site lies further up the hill and is aligned south-west by north-east with an entrance in the north-west wall. The third building lies to the north-east of building one on a slightly higher terrace and is 9m by 4m and follows the same alignment as building two. There is no visible entrance to this structure. See section 3 above for discussion of likely history of site.

6.9 Kilgrossan (NX 195 781) 220m OD

The site was located to the south of a forestry track tucked under a natural knoll. It comprises one rectangular building with five compartments, an access track running in front of it, a small enclosure and a corn drying kiln some 80m to the north of the main building. The main building is aligned east to west with an entrance to four of the compartments in the northern wall. The building is 33m long by 4.5m broad and from east to west the compartment sizes are, 4.5m, 4m, 7m, 3.5m and 10m. The 10m compartment may have two entrances, while the 3.5m compartment has no visible entrance. Construction materials are drystone and a turf addition may be present to the east of the structure (5m by 4m). The site was abandoned between the first and second editions of the Ordnance Survey series (1855-1894), though "Kilgrossan is recorded on the maps of Thomson (1828), Armstrong (1775) and Pont (1654)" .(RCAHMS 1981, 26)

6.10 Meikle Bennane (NX 100 864) 70m OD

The site is located on top of a small knoll directly across the A77 from the modern day farm of the same name. The site comprises the remains of one rectangular structure, a possible second, two enclosures, a kiln c. 30m west of the main group, cultivation traces on the northern side of the knoll and a possible raised access track to the south of the knoll. Attached to the southern side of the northern enclosure the main building on site is 11m by 6m and shows no sign of an entrance. It is aligned north to south and constructed of turf over stone. The second possible structure is appended to

the north of the southern enclosure and is represented by a level platform 12m by 4m with no trace of walling. This is aligned east to west.

6.11 Pinwherry Hill (NX 186 854) 140m OD

A group of four sites range along the southern flank of Pinwherry Hill, each site appears to be late in date, "none appears on maps of earlier than 19th century in date" .(RCAHMS 1981, 28). The sites are Boghead (NX 186 854), Broadmoor (NX 182 853), Backhill (NX 181 853) and Milwharran (NX 178 852). Both Boghead and Broadmoor were visited, both sites were represented by single drystone-built rectangular buildings 13m by 5m and 24m by 4m respectfully. Boghead had two compartments, while Broadmoor had four compartments. They both adopted high ground locations rather than sheltered locales. Both were aligned south-west north-east and in the case of Broadmoor a small potato store was also present.

6.12 Strabracken (NX 142 758) 220m OD

Situated on the west side of the Main Water of Luce c. 200m from the current deserted steading of Strabracken this site comprised one rectangular building and an associated enclosure and was positioned on a natural knoll. The building was 19m long by 4m broad and had three compartments aligned north to south with entrances to each of the compartments in the western wall. Built of turf over stone the compartments were from north to south 4m long, 4m long and finally 10m long and sloping to the south. Alteration was evident along the eastern wall in compartment three where the wall

tapered out to become 6m wide across the southern gable. The site was depicted as ruinous in 1855 (OS).

6.13 Craig Farm (NX 168 871) 130m OD

This site was located by Crispin Flowers (West of Scotland Archaeology Service) in 1996. The site is located on the edge of a steep embankment above the Stinchar Valley and faces west towards Duniewick Fort. The cluster comprises three rectangular structures aligned north-east to south-west, elements of dyking and evidence of a substantial field system. Constructed of drystone which has latterly been turfed over, all the structures are relatively small in size. The largest of the buildings is 7m by 4m with no visible entrance. To the north-west of building one the second building is 4m by 4m and has an entrance in the south-western gable, with what appear to be midden dumps extending downhill. The third building lies slightly to the north-west of this and is 4m by 4m in size with an entrance in either gable and evidence of further dumping downhill. There is also evidence of dyking attached to this structure and heading off to the west.

5.5 Discussion of field analysis results

In order to place the above categorisations into some form of achievable analytical framework it is necessary to compare the South Carrick material with the South Carrick field analysis data. In essence the creation of a set of specific questions is necessary, relating to type sites and their probability of being accurate. To do this a set

of specific graphs has been created, which will allow the discussion of form and structure to be measured against the likelihood of the visual assessment results being accurate and revealing specific types of site. Given that sites do not remain static through time, and the fact that some sites revealed phasing, it is recognised that inconsistencies will be revealed within the data. This is further confused by preservation issues and historical forces, however it is postulated that if specific forms or structures can be distinguished from the assessment information this will be reflected in degrees of probability and can be expressed as a percentage. Given the small numbers of sites involved in this phase of the work any probabilities registered below 75% will be deemed to be a poor result in this scheme of analysis. Therefore only percentage points above the 75% mark will point to reasonable degrees of probability that can be used to reflect type site categories.

The first test case is to measure length of structures against field analysis categorisation, in other words can we see differentiation in type site revealed by specific lengths of structures (see figure 5.17 below).

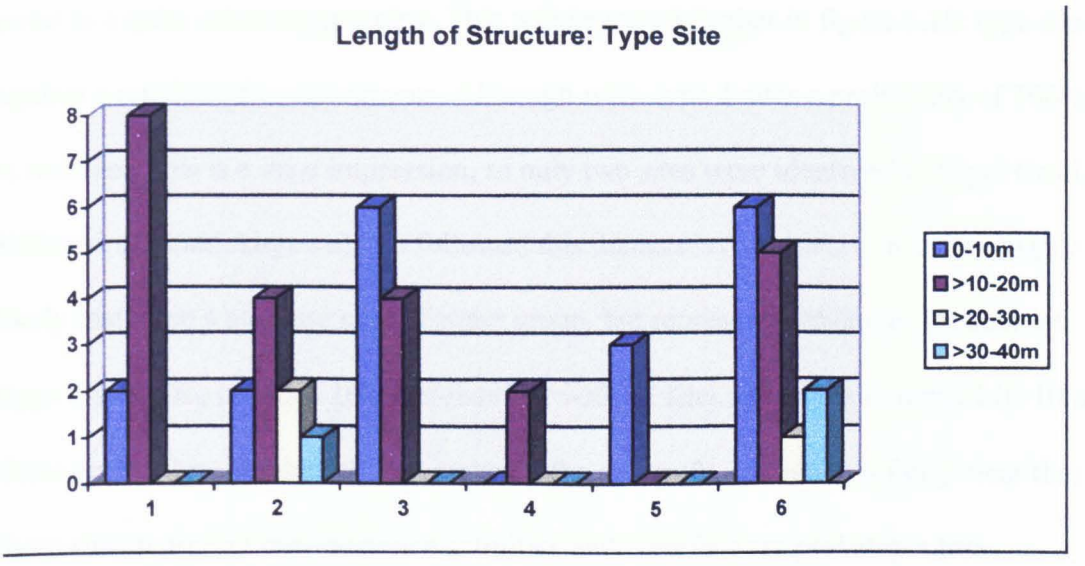

Figure 5.17: Length of structure against type site

Characteristically, very few sites exceed the 20m length division, however this will be discussed further in section 5.6 below where a comparison will be drawn with the North Carrick results as well. For the moment though, it is important to discuss each of the type sites against length. Type 1 sites would appear to have a high probability of a standard length in the 10m - 20m bracket (80%), with only 2 sites outside that range (Both 0-10m). Interestingly, both these sites (High Altercannoch 2 and Lochton Hill) had poor preservation and are therefore not certain examples of type 1 settlements. The type 2 sites are certainly more evenly spread, though a definite peak is visible in the >10-20m range (36% probability), the low probability introduces a degree of doubt into this as a gauge of likelihood. Length is possibly not a viable indicator in this case. The type 3 sites like the type 1 sites also tend to be concentrated amongst the low range groups. They show a 60% probability in range one (0-10m) and a 40% probability in range two (10m-20m). The data indicates that the actual range is between 5m and 13m, with an average length of 9.5m, which in reality would seem to

point to a quite coherent grouping. This will be tested further in figure 5.18: type site against a number of compartments. Although with type 4 sites a probability of 100% is recorded, this is a false impression, as only two sites were identified (Chapel Croft, Killantringan and Airyewn) that followed this distinct layout pattern. It seems highly likely that type 4 sites are not a distinct group, but represent oddities in the data set. Type 5 sites also produce 100% probability with all sites appearing in range I (0-10m). Once again a low number of sites make up the group (3), though it is fairly clear that these sites represent transhumance activities and therefore are probably a true reflection of individual shieling sizes. A such, they do not form part of the analysis of form and structure of pre-Improvement settlements in Ayrshire and lie outwith the remit of this methodology. Consequently, no further analysis of type 4 or type 5 sites will be pursued. The final grouping of sites (type 6) is of course the sites which do not conform to any of the other type site groups and show no individual relationships with each other. As would be expected they represent a wide range of lengths with particular highs in the range I and range II values. Given that 87.5% of all the sites visited fall into these two ranges it is predictable that the majority of non-category sites appear as highs here as well.

The second test case is the gauging of type sites against number of compartments. As has been stated above this will only be done for the main structures on sites assessed as types 1, 2, 3, and 6. For the purposes of integrity of data, those sites assessed as type 4 will now appear in the type six category.

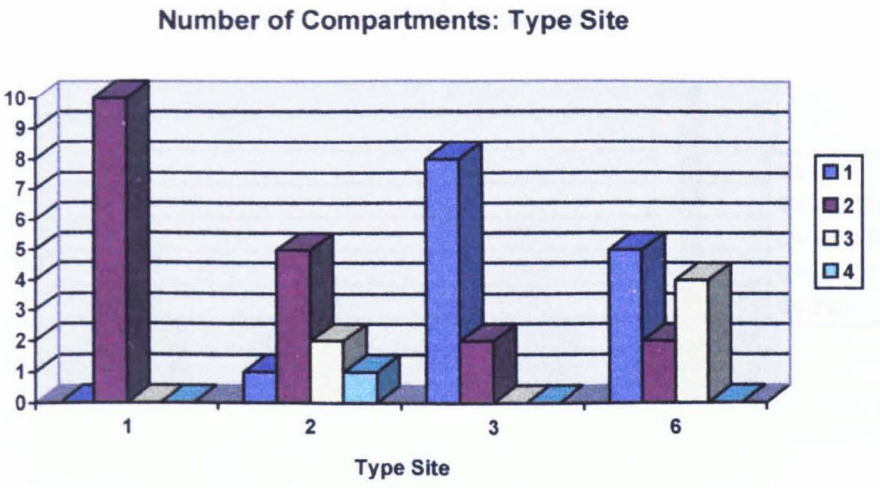

Figure 5.18: Type site against number of compartments

For type 1 sites it is quite clearly a critical element of the number of compartments in the definition of form for these sites, with a 100% probability that type 1 sites will have two compartments there appears to be little doubt of this. For type 2 sites however, the spread over ranges 1 to 4 indicates that certainty is still not completely proven, even though 50% probability of two compartments is statistically evident. Type 3 sites are clearly much more likely to be the single compartment range (80% probability), though it is still possible to have twin compartment sites which fall into this category of monument. As would be expected the type 6 sites are wide ranging, with only 4 compartment structures with 0% probability of occurring. As a final test case it is proposed to examine the position of settlements in relation to height (m OD) to see if any distinct patterns are revealed with regard to structure of settlement and quality of land and by inference form of agricultural activity being pursued (see figure 5.19 below).

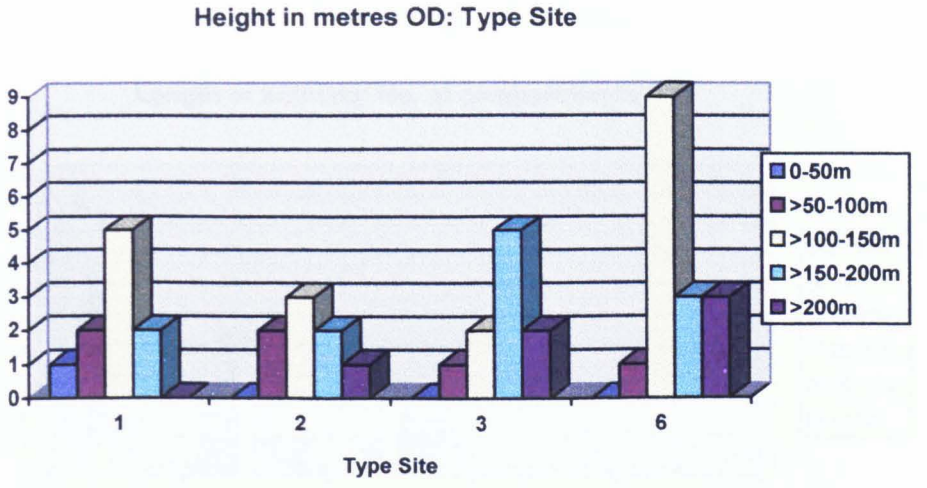

Figure 5.19: Type site against height in metres OD

If we discount type 6 sites from the equation two distinct height associations are present within the data. It would appear that type 1 sites show a 60% probability of being within the 100-150m bracket, though examples of sites were present below this range and above it as well. Likewise the type 3 sites also show a distinct association with the 150-200m bracket.

5.6 Stage 3: Developing an integrated methodology

Stage 3 of the methodology is to take the information garnered from the field assessment and integrate it into a database (see appendix 6). Then in the same manner ask the database questions with regard to compartments and dimensions across the whole of Carrick similar to stage 1 methodology above. As a first stage this will allow a comparison between the length of buildings and the number of compartments involved (see figure 5.20 below):

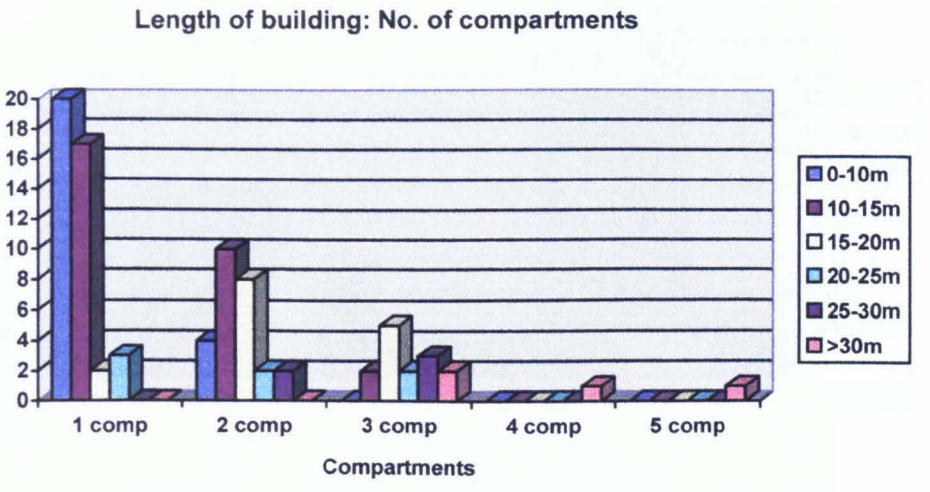

Figure 5.20: Length of building against number of compartments

As would be expected the relationship between the number of compartments and the length of buildings is fairly regular, the small structures (0-10m) dominate the one compartment buildings group. This relationship is reflected throughout the graph and indicates a steady increase in the number of compartments as the length of buildings increase. Two further graphs are proposed for this stage of the analysis. It is the intention to test the theory developed in stage one, and refined in stage two, that particular types of settlement can be inferred within the data. As a starting point, the perceived difference between the two identified groups in stage one, constructed of the one building and one enclosure with no kiln sites (form A) and the three or more buildings, enclosures and an associated kiln sites (form B) will be tested against the length of structure (see fig 5.21 below) and against probability of compartment size (see fig 5.22 below).

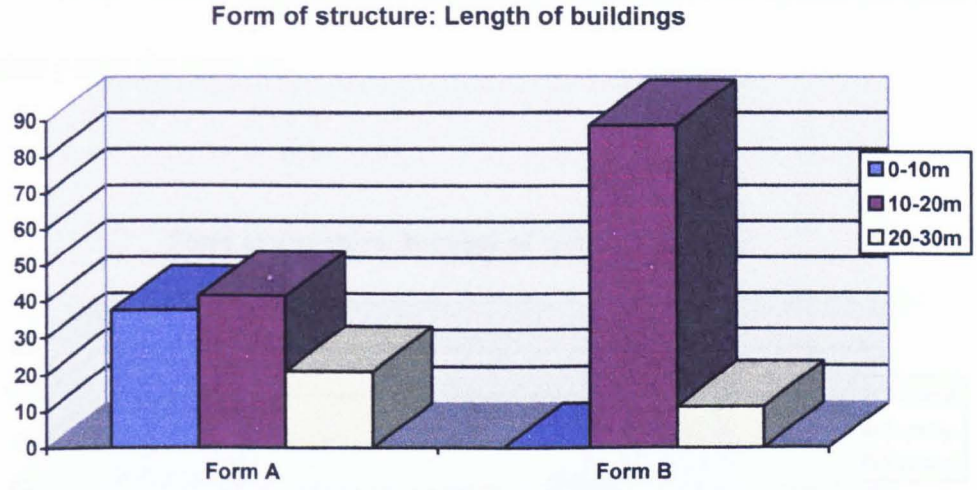

Figure 5.21: Form of structure against length of buildings

The results of the form A sites are not as predictable as the field assessment statistical modelling would suggest. There seems to be a fairly regular spread across the three length categories tested, with low probability ratings in all cases (37.5 % for 0-10m range, 40.6% for 10-20m range and 20.4% for the 20-30m range). This stands in stark difference to the results from the South Carrick material (see fig 5.19 above) which indicated a fairly high probability in the 0-10m range. The reason for this is unclear, but it may reflect a difference in the quality of the survey between North and South Carrick. If we turn to form B, the results appear to very clear with a high probability rating (88.9%) that fermtouns across Carrick which have three or more structures, enclosures and associated kilns, will fall in the 10-20m range. This is an interesting result, and although not directly comparable to the type 2 sites discussed above, it certainly raises questions over the definition characteristics of that group.

Figure 5.22 below introduces the same two forms of structure and compares them against the number of compartments present. Given the results witnessed in figure

5.20 above it was clearly expected that this group would show low peaks for form A and higher peaks for form B:

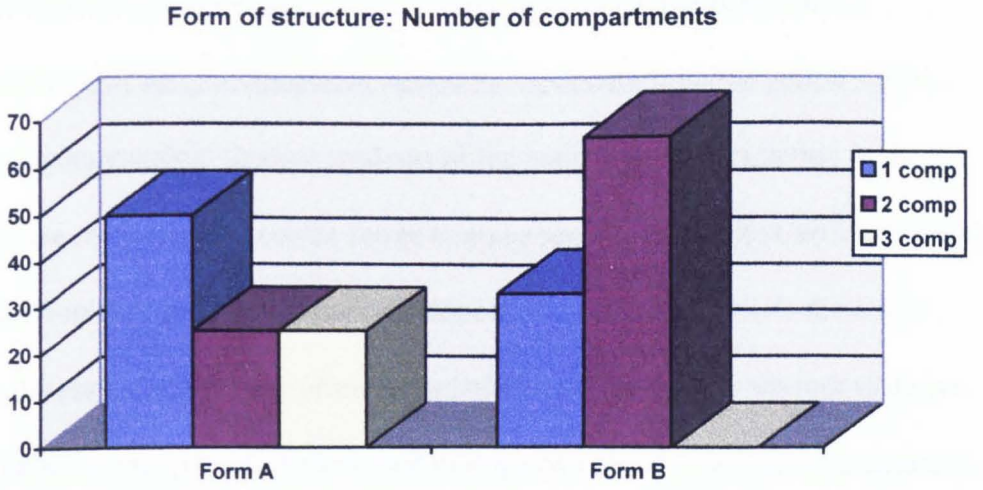

Figure 5.22: Form of structure against number of compartments

As was expected the resulting graph does in fact indicate a low (1 compartment) peak for form A group, in other words settlements which show one structure and one enclosure with no associated kiln do tend to be single compartment buildings (50% probability). However the relatively high peaks for the two other compartment ranges (2 and 3 compartments) does raise questions once again over the differences in quality between the two field evaluations. This is particularly true in the case of the three compartment structures. In the case of the form B structures the probability is even higher for 2 compartment structures being the norm for these sites (66.7% probability). The only unexpected result for this form of settlement is the 0% probability rating for the 3 compartment structures in this group, however this may act as support for the poorer pastoral economy argument (therefore no associated *spence*) which is presented in the historical and archaeological data comparison section below.

5.7 Historical and archaeological data comparison

There are two main sources of contemporary information with regard to the form and structure of agricultural settlements of the period 1600-1870; the Board of Agricultural Reports and the Statistical Accounts. Both date from the period 1790-1840 and are characteristic literary products of the main period of transition in the rural landscape of Ayrshire. In order for us to make some sense of the Carrick material it is the intention here to review these contemporary sources and discuss them in relation to the results of both the primary statistical analysis and the attempt to derive a field assessment categorisation discussed in stage two above. The aim is to assess the likelihood that particular settlement forms relate to particular chronological contexts.

If we start with the Statistical Accounts, it is quite clear from reviewing both the Statistical Account of Scotland (Sinclair 1790-3) and the New Statistical Account (1835-43) that the former is the more useful resource as it was undertaken during the main period of transition in the landscape and consequently offers insight into the settlement pattern prior to improvement. Having said that, out of the 46 parishes in Ayrshire very little was written concerning the form or structure of agricultural settlement cores. Only cottars conditions receive any detailed attention, however it is worth reviewing this in light of the results from the first stage of the analysis and the type 3 sites discussed above. Four parishes in particular refer to cottars' houses, in Kirkoswald for example the then minister (Rev. Mathew Biggar) relates how "cottagers are in number 109, and rent from the farmers a house and yard" (OSA

1791, 392). This reference to a house and yard is also reflected in Kirkmichael parish by the Rev. Thomas Pollock who wrote "the farmers employ two kinds of men-servants, the one such as are called cote-men, who are married, and live on the farm, who receive what is called a benefit, viz. a house and yard" (OSA 1792, 381). Likewise the Rev. James Machrie also makes a similar reference (OSA 1790-1, 88; quoted above). Interestingly, all of those ministers held positions in Carrick parishes, in fact the only non-Carrick reference in the OSA to the form of dwellings comes from Kilmarnock parish, where the minister discusses pre-improvement steadings:

> "a stranger still views, with concern, the poor and mean-looking huts, in which farmers are condemned to dwell, throughout all this country. Their habitation, and that of their cattle, are generally under the same roof, and only separated from one another by partitions, so that the whole family are obliged to sleep upon the ground, on a damp soil, where the floor is not so much as paved with stone or flags, and where there is not even a fireplace to draw off the moist and stagnant air" (1790, 306).

Before we go on to discuss the above quote it is worth reflecting on the cottars' role further. It was quite clear from both the primary statistical analysis and the field assessment that sites with a single building and associated enclosure do seem to stand out as a distinct group. Classified as type 3 sites during the field evaluation phase in South Carrick these sites would appear to be in general terms small single compartment structures located on the upland fringes of the area. This is supported by

the available documentary evidence, in particular William Aiton's description of a cottars house:

> "about the middle of last century, a considerable number of cot-houses were attached to farms....They were....about 12 or 13 (c. 4m by 4m) feet square, the floor damp, had neither partitions, inner-doors nor smoke funnels, and but seldom any glass in the windows....the inmates, consisting of single men, were farm servants" (1811, 125)

This would appear to suggest that these sites are more than likely the abodes of cottars, herdsmen or pendiclers. In other words it would appear that around 22% of the sites identified by the RCAHMS in 1981 may in fact be farm servants' abodes rather than core agricultural steadings. Historically "sub-tenants and cottars had formed an important component of the small communities or fermtouns which formed the basic work and social centres of the Lowland countryside" (Devine 1989, 154), however in South Carrick an entirely separate arrangement appears to be at work. Chronologically, we know from other OSA references (Sorn, Straiton, Kilwinning etc.) that the cotters system in Ayrshire was disbanding by the 1770s, for example in the parish of Straiton in 1791:

> "several farms that formerly kept two or three families, are now possessed by individuals. Of this frequent proofs are seen, in the vestiges of old houses, of which only the foundations remain. In all counties, where the people live chiefly by pasturing cattle, this will be the case. As they improve the

enclosures etc. fewer hands are necessary to superintend the flocks and herds" (1791, 629).

Although this gives us a ballpark date for abandonment of type 3 structures we have no way of assessing whether the arrangement of servants accommodation was a by-product of a pastoral economy and in consequence in place for a long time or whether it was as a result of the changes in agricultural practice in the eighteenth century. Though Devine suggests that there is abundant evidence that sub-tenancy was being steadily crushed as the pace of Improvement quickened. "By 1815 it was but a minor part of the Lowland agrarian system" (1984; 1989, 155; Gray 1973). The real question of course, is related to whether cottars were indeed integrated within fermtouns (cf. Devine 1989), or did they hold satellite small holdings away from agricultural settlement cores during the period up to the Improvements in upland Ayrshire. The archaeological evidence is not illuminating here, though the cartographic evidence indicates only one site noted as appearing on a pre-1855 map (i.e. Darnarroch 1). This would be expected if these sites simply reflect servants' cottages and not fermtouns as such, however the corollary of this would be that cottars dwellings are short-lived settlement locales, related to individual cottars tenurial agreements with tenant farmers. In which case, the archaeological history of this form of dwelling may be very short-lived indeed, which may have further implications for understanding the chronology of this form of social system as well.

If we now turn our attentions to the above quote from the minister of Kilmarnock parish as it appeared in the OSA (see above). Characteristically the tone of the

Reverends McKinley and Robertson reflects the propensity of the age to modernise. However it does relate that farm houses in general were built with associated byres and did have earthen floors, which goes further than most contributors to the OSA, who merely reflect disgust with agricultural settlements. We need to turn to the Board of Agriculture Reports however for a more considered view. The reports written by Colonel William Fullarton in 1793 and William Aiton in 1811 are a critical tool in the understanding of pre-improvement settlement in Ayrshire and their contents are therefore worth repeating at length:

> "About fifty years ago....The houses were only 12 or 13 feet wide (c. 4m), and the walls 4 or 5 feet above the floor. That part of the building, which served the family for lodging sleeping, cooking, dairy etc....denominated the *in-seat*, was 12 or 14 feet square, with the fire either in the centre or the gable, without jambs or smoke funnel. On larger farms another apartment, of nearly the same dimensions, and which entered through the in-seat, was called the *spense*, in which were stored the meal chest, sowen tub, some beds, a cask into which the urine was collected, known by the name of the 'wash-tub', spinning wheels and reels, when not in use, and the goodwife's press, if she had one.
>
> The other part of the building was occupied by the cattle, which generally entered the same door with the family; the one turning to the one hand, by the *trans-door* to the kitchen, and through it to the spense, and the other turning the contrary way by the *heck-door* to the byre or stable. The trans and heck doors were in the centre of the partitions, so that the people in the in-seat saw

> butt to byre, and the inhabitants of the byre and stable could look ben into the in-seat....The principle door by which the family entered was, was named the *fore door*, and the other opposite, was called the *yard door*" (Aiton 1811, 114-5; Strawhorn 1959, 59-60).

This is the classic description of fermtouns in the Ayrshire lowlands and appears to be well reflected within the statistical analysis where a clear focus was present for sites which had two or three buildings, an associated enclosure and a kiln (see stage one above). Similarly the results of the field analysis above also indicated the presence of a distinct group of sites, categorised 'type 2 sites' which are generally represented by multiple structures (ranging between 3 and 6) with multi-compartments set out along either side of central access tracks. Type 2 structures also have clear associations with kilns and outlying structures with opposing doors, which probably represent barns. During the discussion of the field analysis results it became clear that the statistical modelling of lengths of structures and numbers of compartments did not give very clear results, and in fact reduced the probability of this representing a coherent group. However if we take the historical evidence on board it appears that the addition of a spence only happened on larger, presumably wealthier, farms, therefore two compartments may have been the norm for upland settlements in Carrick. This was reflected in the statistical modelling of the group with a 50% probability. The historical evidence of this is further enhanced by John Mitchell writing in a book entitled *Memories of Ayrshire about 1780*, in which he states that "dwellings were frequently connected with a cow-house or byre and a stable" and they "consisted of a kitchen or larger apartment....as well as an inner apartment, usually called 'spence'

(*which was **sometimes** attached to it* and which opened by an inner door)" (*own emphasis*; 257-62; Strawhorn 1959, 60-1). In terms of chronology, both the surviving archaeology and the cartographic evidence would appear to give relatively late dates for type 2 sites. The sites generally exhibit drystone structures which in some cases are well preserved (e.g. Clauchrieskaig). Even in cases where the majority of upper stonework has been removed the turf cover is still relatively light (e.g. Macherquhat). The cartographic evidence would appear to support the historical evidence in placing this form of site in the eighteenth century, though in the case of four of the eight sites identified (Kilbride Knowe, Half Merk, Balsalloch Hill and Mark, Glen App 1) an earlier date may be possible. Although in reality only one of the four sites named above can possibly be ascribed an earlier date on archaeological grounds. Interestingly, the site in question is Kilbride Knowe which was identified during the field assessment as potentially exhibiting phasing; a probable type 1 site which had latterly been altered to a type 2.

This brings us round to the final group of sites which need to be discussed, that is the type 1 sites identified during the field assessment phase. These sites are generally represented by single two compartment structures with an associated yard and no visible entranceways, though in some cases multiple buildings were present, as well as kilns. The main feature of difference was of course the stepped arrangement between compartments and the fact that they tended to be completely turfed over with only vestiges of stonework apparent. The statistical modelling clearly indicated that two compartments (100% probability) and in general a length range between 10m and 20m (80% probability) was apparent from the ten sites categorised as 'type 1 sites'. In

terms of contemporary historical evidence for this form of structure, no sources have been clearly identified. Although the field assessment and statistical modelling suggest a distinct group which has previously not been identified, the primary statistical analysis (stage 1, section 5.3 above) did not place this group in a distinct category of its own. Without the field assessment this group would not have been identified. As far as the cartographic evidence is concerned, of the ten sites denoted as type 1, only two appear on the seventeenth century Pont's map (Old Parks of Gleick and Kilbride Knowe), in fact only four of the ten appear on any map coverage pre-1855. In a sense this may be the key to their understanding, we may be witnessing an early form of settlement, possibly constructed of turf or clay (hence the lack of entrances witnessed during the field assessment), and in general pre-dating the map coverage and contemporary references for the county. Without absolute chronological dating, something that can only be achieved by a programme of archaeological excavation, this group remains an enigmatic possibility.

5.8 Conclusions

The analytical work has cast up some interesting results within the field evaluation data produced by the RCAHMS during their survey of the area in the early 1980s. Following on from the field assessment phase of this doctoral work a number of points have become abundantly clear, which cast light on the possible uses of such analytical work in other areas of Scotland. It is the contention here that on a macro level we can employ analytical techniques on survey data which is not only separated in time, but is also separated in quality, and still achieve a better level of

understanding of the changes in form and structure of the rural settlement pattern during the post-Medieval period. However if we want to achieve a clear understanding of the forms of MOLRS sites in Scotland, then we need to approach all survey and recording work with the aim of analysis in mind and not simply as an exercise in recording. The incongruities apparent between the RCAHMS field assessment results and this works' field assessment results are problematic in some cases. The RCAHMS have come a long way since the 1980s in their development of mass survey techniques and in some areas have begun to identify specific forms (e.g. Pitcarmick-type buildings). Nevertheless, to be able to achieve clearer understanding in the absence of excavation strategies archaeologists need to develop tools that will allow clearer understanding of the morphology of sites. It is quite clear that without the field assessment phase of this work the 'type 1 sites' would still not be recognised as a specific form and we would be no nearer to creating chronological differentiation within the morass of settlement data for the Carrick region of Ayrshire.

Chapter 6

An archaeology of Improvement: The role of lime burning in the transformation of the rural landscape

6.1 Introduction

So far we have discussed the agricultural settlement pattern as a whole with only limited reference to the role of domestic industries. It is now essential that we define more clearly the role of domestic industries in the Improvement period and how they are crucial in the understanding of the cultural landscape in general and the mechanics of change within early modern agricultural regimes in particular. A considerable body of work produced by Scottish historians and historical geographers already exists. This tends to detail the sequence of events and the role of particular practices in the wholesale change of agricultural regimes over the period of the seventeenth to eighteenth centuries. However, few writers have given any credence to the use of burnt or slaked lime as an incisive factor in the changes of the Improvement period. It is contested here that the use of lime was a crucial element of the change in the landscape which allowed production levels to be increased and in effect underwrote large-scale landscape change. To understand the industrialisation process more fully it is the intention to review the Improvement debate and construct an alternative synopsis, which will be supported by the construction of an archaeology of lime burning.

6.2 A historical typology of lime production: chronologies of form

The historical development of lime production in Britain still remains something of a Cinderella subject, although Williams has produced a distillation of the historical development of the industry (1989) there are no comprehensive studies available at

the moment (cf. Ellison *et al*, 1993). Having said that, it is also abundantly clear that particularly in the field of Medieval limekilns "over 50 have been archaeologically investigated in England alone" (Ellison *et al* 1993, 221). The Scottish industry has not been assessed on anything like that scale, with authors tending to concentrate their efforts on the latter end of developments in the eighteenth and nineteenth centuries (e.g. Skinner 1969; Donnachie 1971; Clarke 1984; Hume 1996). It is therefore necessary to review the work in England in order to give a clear picture of the development of the lime industry, prior to discussing the picture in Scotland and in Ayrshire in particular. The work in England has indicated that the initial interest in quick lime appears to be first documented in the Roman period. Authors such as Pliny the Elder in the first century A D and Cato wrote about the need to produce liming materials in the Celtic world, specifying Britain within their work (see Gardner & Garner 1953; Williams 1989; Ellison *et al* 1993 for further discussion). The documentary evidence is supported by "increasing archaeological....evidence for the existence of limekilns in Britain from the Romano-British period" (Leach 1995, 145). Although kilns have been excavated and dated to this period at Chew (Somerset), Weekley (Northants) and Wellhead (Wiltshire), they have generally been viewed as kilns for production of lime mortars, rather than agricultural kilns. Although no Scottish examples have so far been dated, sites such as Gourdie Roman Fort clearly indicate production centres (see Leslie 1995, plate 1), which have also been interpreted as lime mortar production kilns. The documentary evidence is not as clear cut however, "Cato in his work, *De Agricultura*, mentioned and advocated the use of lime in agricultural practice to neutralise acid soils" (Ellison *et al* 1993, 220). Taken at face value, it may indicate that agricultural liming in the Romano-British period

was an alternative usage. Whatever the end product was used for, the discussions within the literature are quite clear that the kiln forms were of the intermittent variety. In other words Roman kilns worked on the premise of one single firing which lasted for a number of days and did not allow for the introduction of more fuel or limestone into the kiln during firing (see below for full discussion). Moore-Coyler has assessed this form of kiln as "widely used in Roman times, and indeed, through to the early nineteenth century in parts of England and Wales" (1990, 22).

Interestingly the period from the end of Roman influence in Britain to the Middle Ages is marked by an apparent cessation in production of lime in this country. When limeburning was once again initiated a proliferation of technology appears to have been established. The earliest Medieval kiln so far identified were excavated at Castle Acre Castle (Norfolk), dated to c 1085; the kiln was clearly of the intermittent variety with a clay lining within the pit chamber and one drawhole (see Coad *et al* 1987). Although intermittent forms of kiln technology would be expected at such an early date, Ellison *et al* have argued that running kilns, that is kilns able to be fed with more fuel and limestone during firing, "developed during the Medieval period" (1993, 221). This would appear to stand in stark contrast to much of the received knowledge on this form of kiln which would have its development occurring in the eighteenth century (e.g. *contra* Leach 1995). The sophistication of the kiln banks excavated at the Swirle on Newcastle Quayside by Ellison *et al*, and dated by pottery sequences and archaeomagnetism to the early and late fourteenth centuries appear to support the supposition that technological advancement did not have to wait until the Improvement period to allow running kilns to be developed. So far we have

considered the two main forms of kiln and their dating, however a third form of kiln has been suggested by Stevens (1990). His work in Eastbourne has identified a group of three flueless lime burning pits, dated to the twelfth century. Although there are no comparable examples known elsewhere in Britain ethnographic analogies from the Third World would appear to indicate the viability of this form of kiln. Ellison *et al* have suggested that "an evolutionary development of limekilns took place in the Medieval period" (1993, 222), though they have not specified that evolution in chronological terms. Analysis of excavation reports would appear to suggest that the earliest forms where clearly intermittent (or clamp) kilns and the sole example of a flueless lime burning pit, which were latterly followed by running (or draw) kilns. However the dates so far produced for these sites are not clear in this typology. For example excavations in Southampton (Platt & Coleman-Smith 1975) and Bedford (Hassall 1979) have indicated thirteenth century stone lined intermittent kilns occurring prior to draw kilns, though clamp kilns are also clearly a feature of the landscape well into the nineteenth century. The reason for the confusion of typology dates may well reflect the usage of kiln types, as Skinner has summarised for the limekilns of the Lothians:

> "While clamp kilns were obviously cheaper and quite satisfactory for light production, they could not compare economically with the greater output of lime from massive drawkilns and it is the stone-built vertical kilns that become the characteristic feature of the industry" (Skinner 1969, 12)

The point may well be valid in Medieval production terms, sites like that at the Swirle, Newcastle where the production cycle during the last firing of the kiln bank has been estimated at not less than 51 days (Ellison *et al* 1993, 224) may well indicate a division in forms of usage between kiln types. If on the one hand production was on the large-scale for export purposes then the added expenditure on draw kilns would have been essential. On the other hand, if production was designed to satisfy the needs of a small agricultural community, then production levels would only require limited amounts of lime, and consequently the cheaper clamp kiln would suffice. Although Ellison *et al* may well be correct in suggesting that a broad evolution took place, it is equally important to consider the likelihood that typologically the form of kiln technology is also related to the level of production. This by extension, means that differences in form of kilns between the agricultural and urban zones are a likely consequence.

So far the discussion of form has centred on examples identified during excavations on sites which have remnant evidence of kiln forms, it is now essential to view the evidence from surveys of standing forms to achieve more clarity in terms of the discussion. "Although a number of Medieval limekilns may be associated with the production of agricultural lime....lime was primarily consumed in that period by the building industry" (Ellison *et al* 1993, 223). Certainly by the sixteenth century an expansion in use of agricultural lime was clearly under way. Even in Ayrshire the application of burnt lime was becoming a component of the agricultural regime within the Kylesmure lands of Melrose Abbey (Sanderson 1975). This was also reflected in England where burnt and slaked lime were being utilised within the agricultural

landscapes at the same period (cf. Moore-Coyler 1992). The types of standing remains dating from the early modern and early industrial periods in Britain indicates a variety of above ground forms not noted within the excavated examples. Although few excavated, and in consequence dated examples, are apparent in the literature, the earliest types tend to be circular clamp kilns and date from the sixteenth and seventeenth centuries. However, it is also abundantly clear that rectangular forms have been found to pre-date circular structures in some cases, for example in the Chew Valley, Somerset (Rahtz and Greenfield 1977). The circular form of clamp kiln appears to be fairly widely spread and in general they have been termed 'sod kilns', though in particular places, for example Northumberland, are known as 'sow kilns'. These small clamp kilns tend to be constructed on a ring of turf and stone with a single-draw entrance and operated as intermittent kilns with the fuel and limestone layered up to provide a mound and sealed by turfs. After firing the kiln would burn for up to two weeks prior to cooling and raking out of the burnt lime and ashes. Skinner has suggested that

> "the characteristic lime-burning installation of earlier centuries was the horizontal or clamp kiln, an easily and cheaply built contrivance of turf, earth and field stones equally easily renewed, dismantled or forgotten when firing was complete" (Skinner 1969, 10)

In Scotland this was undoubtedly true; although circular clamps tended to be abandoned in favour of long rectangular 'horseshoe' clamp kilns, the basic technology remained the same. Horseshoe clamp kilns were an important feature of the

agricultural landscapes of many areas in Britain, particularly so in Scotland where kilns of this form tended to survive into the late nineteenth century, only being superseded eventually by the large-scale production limeworks when transportation infrastructures permitted. As Leach has suggested clamp kilns "are more usually associated with the production of agricultural lime and played a significant role in enclosure and improvement of the land" (1995, 145). Although there is certainly an element of truth in his statement, it is clearly the case that the development of running kilns during the Improvement period in Scotland, and elsewhere, played a crucial role in agricultural transition. Prior to discussing the development of draw kilns it is also worthwhile noting the existence of a different form of clamp kiln in operation during this period. Leach has recently discussed (1995) the existence of a class of clamp kiln peculiar to Derbyshire, known as a pye kiln, which operated in a similar fashion to the long horseshoe clamps elsewhere in Britain, though having a slightly different arrangement in terms of updraft vents. Although their distribution would appear to be limited to a small geographical area, Leach also implies that "there are no known examples of clamps or pyes in the south of England" (1995, 156). Given the substantial number of Medieval kilns excavated in the southern counties this would appear to be at best a poorly understood resource, and at worst an over-generalisation of the facts.

The expansion in kiln technology so characteristic of the Improvement period is of course the development of vertical or draw kilns throughout the British Isles. Although no systematic survey has been undertaken, in general the development of stone constructions to act as continual feeder kilns is normally seen as a product of the

eighteenth century. Some authors have gone as far as relating the new forms of kiln to specific developments in the scientific world, "the outstanding contribution came from Joseph Black, professor of Chemistry in Edinburgh, who in 1752 discovered the nature of the age-old lime burning process" (Gardner & Garner 1953, 15). What is abundantly clear is that the development of the agricultural lime industry was aided substantially by the construction of continual feed draw kilns which led to production levels eventually outstripping the building industries need for the product (cf. Ellison *et al* 1993). What is also clear from the limited work that has been undertaken, is that the form and constructional approaches throughout Britain differed considerably. In eastern Scotland Skinner (1969) has assessed a six stage typology for draw kilns, whereas in south west Wales Moore-Coyler's work (1990; 1992) indicates far less sophistication in kiln design. In upland areas such as Cumbria the small scale of draw kilns have led researchers to conclude that:

> "small round kilns were still being built in some parts until the middle of the nineteenth century....many of these kilns could still be called farm kilns, that is to say they were intended to produce lime for the particular farm and its immediate neighbours" (Cleasby 1995, 19).

The variety of form implies an industry which functioned on a number of levels, from production at local level for particular farms or groups of farms to production geared to entrepreneurial level and export to other regions. Although draw kilns varied in shape and size the degree of technology involved was consistent throughout, by the early nineteenth century large-scale limeworks were already a feature of the landscape

in most areas. The establishment of Charlestown and Limekilns limeworks in Fife in the middle decades of the eighteenth century became synonymous with investment in plant and large-scale production in Scotland, a central feature of the industry north of the border (see Skinner 1969; Hume 1996).

6.3 The coming of the Improvements: The role of lime burning

So far we have assessed the technological changes that are evidenced by the remains of the limeburning industry in Britain, it is now time to pose the question: was lime burning a critical factor in the improvement of the agricultural landscapes of Scotland ? Campbell has claimed that:

> "The history of agriculture suffers from an initial handicap. Much discussion of the Scottish economy, whether of historical or contemporary conditions, is biased towards an examination and evaluation of the country's industrial background and especially of the place of the heavy industries in it" (Campbell 1994, 58).

Campbell statement is clearly cogent in this respect, a feature which has been discussed already within this work in relation to the archaeology of industry and the historical development of Ayrshire (see chapters 2 & 3). It is no coincidence that the archaeology and history of agricultural limeburning in Scotland has received so little attention in the past. It is postulated that this is a critical failing which has led to misconceptions over the importance of agricultural liming in the transitions of the

Improvement period. Those authors who have commented on the role of limeburning during this period have been very clear about the relationship, for example Whatley has summarised as follows:

> "It is in the undoubted increase in crop returns, land values, and rentals, to which the liming of ground was a major contributor" (Whatley 1975, 316)

Limeburning and the application of slaked and burnt lime played a crucial role not only in the increase of yields from land already under cultivation, but it also enabled reclamation projects to be founded on a solid base. The importance of lime to the Improvement movement is reflected throughout the lowland estates, not only in terms of its use in conjunction with enclosure to raise cropping yields, but also as a clear indicator to the tenantry that change could be effected quickly. As Devine has suggested:

> "those improvements 'the effects of which are soonest discovered', namely enclosure and liming, should be put in place as these should demonstrate quickly and tangibly to the tenants the effect of better methods" (Devine 1994, 87)

This of course had the dual effect of giving immediate returns from the initial investment and also demonstrating to the tenantry that change was worthwhile. However, the importance of lime should not be seen as a simple agricultural agent of change; as will become apparent in the following discussion, lime was also an agent

of change within the industrialisation process as well. In order to understand the powerful position of limeburning during the improvement period it is essential to review the history of liming as a first step.

Liming in Ayrshire was clearly understood as early as 1527, its sale and application within the agricultural calendar being clearly referred to in relation to the Mauchline estate of Melrose Abbey (see Sanderson 1975, 92). This would appear to contradict Fenton and Smout who have stated that "in certain places the use of lime first produced spectacular results in the seventeenth century" (1965, 82). Although the claim by Fenton and Smout is supported by other authors (e.g. Whatley 1975; Whyte 1979; Whyte & Whyte 1991) the evidence from Ayrshire is fairly conclusive. Whyte in a passage discussing the possible early use of lime on monastic estates had claimed that "there is as yet no definite manuscript evidence that lime was used in agriculture earlier than the last years of the sixteenth century" (1979, 201). This was clearly not the case as Sanderson (1975) had already proved its use in the early sixteenth century on a monastic estate. Considering the documentary evidence from England and Wales which also suggests an early- to mid-sixteenth century use of lime for agriculture (Ellison *et al* 1993; Toft 1988), it would seem remarkable that the Mauchline estates were the sole practitioners of liming in Scotland during this period. Though the use of lime in Ayrshire during the early fifteen hundreds may well have been restricted to monastic estates, and in consequence was limited in its effect. The Coquet books of the port of Ayr (1577-1632) certainly show no evidence of trade in the commodity (Mackenzie 1988), though as Fenton and Smout noted:

> "According to Timothy Pont in 1604, the county [Ayrshire] was 'fertile in corn and store, being of deep fat clay soil much enriched by the industrious inhabitants liming their grounds'" (Fenton & Smout 1965, 83).

Whyte suggests that the practice had become well established by 1600 and had indeed begun to be practised on a large-scale in the 1580s or 1590s. He is also unequivocal about the early years of the following century as the principal years of a small revolution in limeburning: "it is certain that it underwent a considerable expansion in the first 30 years of the seventeenth century" (Whyte 1979, 201). The early history of limeburning and application within the agricultural regimes has not been charted on anything more than a rudimentary level in Scotland. Although the south-western and eastern lowlands have received some attention (e.g. Skinner 1969; Donnachie 1971; Moyes 1976), that work has tended to focus on the expansions of the eighteenth and nineteenth centuries. This lack of detailed study across the country has been compounded by studies which have focused more on the larger scale production during the later period. Quite clearly the expansion of interest in liming during the seventeenth century has not received the attention it deserves so far. The literature with few exceptions (e.g. Whyte 1979, 198-208) has only made passing reference to transitions in agriculture and the importance of the lime industry during the early modern period. Although the scale of extraction and burning remained a capping feature of the industry prior to mid-eighteenth century, limeworking and application was an important feature of agriculture in areas such as Ayrshire and the Lothians prior to this. Certainly by the end of the seventeenth century its use was not restricted to arable areas, but was also being utilised in northern Ayrshire's pastoral regions,

where the "impact of liming was expressed more in terms of increase in dairy production" (Whyte 1979, 201).

By 1700 the use of liming had reached a critical stage in the Scottish lowlands, with larger scale extraction becoming a feature of the industry; large-scale limeworks were beginning to appear throughout the arable and pastoral zones underwritten by early improvers such as the Scotts in Montrose in 1696 (Third 1953; III, 94) or on the Duke of Hamilton's estates in Lanarkshire with the founding of the Limekilnburn workings (Third 1953; IV, 73). Although Devine has recently (1994) assessed the transformations (i.e. technical changes) as relatively low key during the first half of the eighteenth century (see chapter 2 for further discussion), it is no coincidence that the major phase of expansion in limeburning should occur in the 1740s, 1750s and 1760s just as the full force of landscape change and transport infrastructure developments (e.g. 1767 Ayrshire Turnpike Road Act) were being initiated. Whatley has assessed this development and concluded that "from the 1750s and 1760s its use in agriculture became particularly widespread and intense" (1975, 311). Agricultural demand for lime fell after this period, though this could be expected given the speed of change in those two decades.

By the 1790s and the production of the *Statistical Account for Scotland* the relationship between liming and land improvement is clearly referred to in 39 of the county's 46 parishes, the majority of which actively quarrying and burning the mineral. For other coastal parishes that were not as well endowed with limestone, importation from Ireland was clearly under way. Ayr is the classic example of this

with the minister in the Statistical Account alluding to the coal trade with Ireland and referring to how:

> "this trade is chiefly carried on by vessels belonging to Ireland, which import a considerable quantity of limestone, of an excellent quality. The lime when burned and slacked, is sold at 7d. per boll" (OSA 1790, 42).

It would appear that the limestone was essentially brought into Ayr as ballast. Ayr was not alone in importing limestone from Ireland, references indicate that imports of Irish limestone as ballast were occurring at the ports of Saltcoats and Irvine during this period (Moyes 1976, 23). There are also suggestions that "in one part of south Ayrshire, where lime was imported from Ireland, kilns were made of turf and the imported lime was burnt near the shore" (Anon 1840, 42 [quoted in Whatley 1975, 315]). The movement of stone (rather than burnt lime) is in itself unsurprising, as burnt lime could be a dangerous commodity if the chemical reaction with water was to occur. The mixing of burnt lime with water leads to an exponential rise in temperature which could be disastrous for a timber ship. The fact that limestone was being imported for burning and slaking in Ayrshire also suggests that the distribution of kilns may well be apparent even in areas where no limestone deposits exist (see below for further discussion). Other references from this period suggest a fairly wide movement of limestone, particularly from the northern parishes of Beith, Kilwinning and Dalry which were the largest producers and "supplied much of Renfrewshire, as well as Ayrshire" (Whatley 1975, 311). Cross parish movement of the mineral from parishes that had substantial supplies to ones where no limestone was naturally

occurring was also a feature, for example limestone appears to have been transported to St. Quivox parish from Symington or Craigie and the Statistical Account for Ballantrae also makes reference to lime resources and application within the parish:

> "There is plenty [lime] within half a mile of the extremity of the parish" (OSA 1790, 51) and "Some small experiments have been made in liming; which have succeeded in the utmost expectations" (OSA 1790, 51)

The practice of liming was clearly very widespread throughout the county by the end of the eighteenth century. So much so that it led one commentator to claim that more lime had been applied in the county than "in any district of the same extent in Great Britain, during the same period" (Aiton 1811, 377).

The history of the lime quarrying and burning industry during the nineteenth century is marked by fluctuations in production, leading to periods of over-production and the failure of some limeworks. The industry itself operated on a number of levels from estate-based kilns which produced for the local community and on a limited entrepreneurial level, to larger production centres which produced primarily for the market place. The development of transport infrastructures from the late eighteenth century onwards aided the process of centralisation of production which had the inevitable effect of leaving the smaller-scale farm-based kilns behind. As Robertson *et al* suggest

> "with the development of railway and road transport it became more convenient and cheaper to obtain supplies of lime from a distance, and local lime-burning was soon abandoned in most places" (1976 12-13).

During the agricultural depression of the 1820s "there occurred a general fall in the agricultural demand for lime and with selling prices low not a few limeworks were temporarily or permanently abandoned" (Skinner 1969, 27). The small-scale farm kilns were the worst affected; however, even larger production sites were not immutable to swings in the market, sites like Cairnshalloch in Straiton and at Kilnhouse in Dalry had clearly failed by the 1850s. Although production levels in the larger enterprises were re-established after the 1820s with the Broadstone Quarries in Beith producing 18, 000 tons of lime a year, by the late 1830s, for markets in Glasgow and Paisley, the central feature of production was now for industry rather than agriculture. Butt's summation of the position that "it was primarily the use of lime in agriculture which led to the multiplication of kilns in the countryside" (1967, 62) is accurate, though whether Whatley's suggestion that most agricultural lime "was produced from small limekilns operated by individual farmers" (1975, 314) can be supported is more problematic. Certainly the role of agricultural lime in facilitating improvement was clearly central. It allowed estates to increase yields, which had the dual effect of being successful while at the same time being seen to be successful in the eyes of the landowners tenants. The dramatisation of how change could be effected by liming in conjunction with enclosure was a winning combination. Analysis of the Ordnance Survey information gleaned from the first edition series indicates that smaller-scale kilns were still clearly part of the landscape by the 1850s,

even though substantial numbers had already been abandoned. The importance of this will be discussed below, for the moment though it is important to move away from the agricultural importance of lime and view its industrial importance as well.

Figure 6.2 Auchmannoch limekilns, Sorn

The lime industry has tended to be viewed as having importance only within the agricultural sphere during the improvement period. This under-estimates the role of the industry; although agricultural change was effected by the growth in lime production, the industry had a large-scale impact in the industrialisation of the rural landscape as well. Within industries such as coal mining and iron production (particularly after the 1860s) the demand for limestone was critical. Whatley has assessed that the level of production within the coal industry to support agricultural lime in 1829 was around 88,450 tons, "or at least twice the quantity that was being used by Muirkirk ironworks" (Whatley 1983, 64). This stands in contrast with exports of coal from Ayrshire ports between the 1790s and 1840 which saw a rise in trade from 43,000 tons to 345,000 tons by the end of the period. When export levels are considered for the coal industry it is clear that the expansion of the limeburning sector during the late eighteenth and up to the mid-nineteenth century played an important role in supporting the expansion of coal-mining and exporting. Although there are no direct figures for production over the same period the limeburning industry was clearly still developing and expanding up to the 1820s collapse and beyond. New kilns were being established, for example Campbell of Auchmannoch "erected a draw kiln last summer" in Sorn parish in 1789 (OSA 1790, 539) (see fig 6.1 above). After the collapse of prices new investment occurred with new kilns established at Guelt and Mansfield quarries in the late 1820s. Much of the production of coal for the larger estate and entrepreneurial limestone quarries came from dedicated pits, 78% of the output from Bargany pit in 1811 went specifically to limekilns in the area, such as Lanhielanes (see fig 6.2). This was also reflected on the Loudoun estate colliery "where a steam engine was fitted to supply five local limekilns as well as the small

populations of the villages of Darvel and Newmilns" (Whatley 1983, 62; also see OSA 1791, 442). As the agricultural market decreased after the half century the demand rose from the iron industry in the county. In chapter 2 the rapid expansion of the iron industry after 1840 has already been discussed, however it is worthwhile re-iterating this in relation to the use of lime as flux. Whatley has suggested that "by 1867 it was the 'large and constant' demand from the iron industry that was drawing on Ayrshire's limestone reserves" (1975 314). This is undoubtedly true, although the transition was clearly underway as early as 1843 with a three-fold increase in the number of Ayrshire furnaces occurring. When Carmichael produced his *Account of the principal limestone quarries of Scotland* in 1837 he highlighted 9 main extraction sites in Ayrshire. In comparison to the sites identified as operational in the late 1850s, that is the sites defined by the Ordnance Survey as 'limeworks', there is a rise in numbers to 20 sites. Although some major extraction and processing sites such as Broadstone Quarry are not included in the 1850s data, there is still a sea change witnessed in numbers. It is postulated that this reflects the increase in production related specifically to the growth in iron production of the period, certainly by 1854 the numbers of furnaces had increased ten-fold from the 1830 level to 41 furnaces in operation.

It has been argued above that the lime industry held a central position in the transition of the rural agrarian landscapes of Ayrshire in the period 1750-1850. The importance of the industry however, clearly extended beyond this sphere and also played a critical role in the industrialisation of the rural landscape. It is now time to view those

changes through the archaeological remains by assessing the resource as it stood in the 1850s.

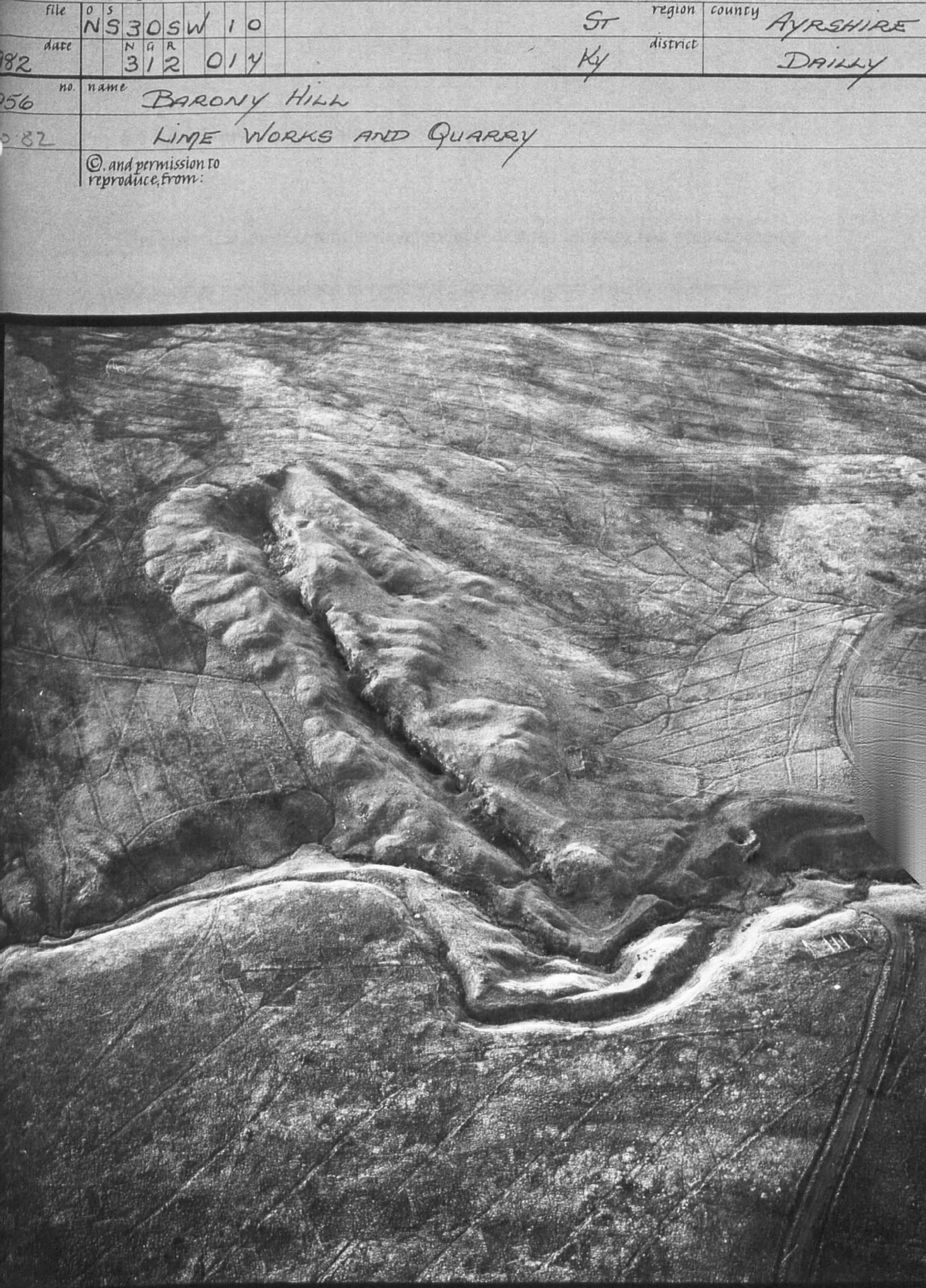

Figure 6.3 Lannielanes (Bargany) limestone quarry (source: RCAHMS)

6.4 Limekilns and Ayrshire: a case in point

The historical context for the developing limestone industry has been discussed above; it is now proposed to review the archaeological remains of Ayrshire by utilising the data available within the first edition series of Ordnance Survey maps. Although a small number of entries have been included in the *National Monuments Record for Scotland* (NMRS) the vast majority of surviving sites have not been catalogued and remain a little understood or recognised resource. It has not been the purpose of this work to visit and assess the condition of every known location of limeworking activity in the county, however an appendix has been created which gives the location and grid reference of the 395 sites recovered from the first edition series (see appendix 7). The role of this work has been to assess the resource by examining the distribution of sites, the age of sites and the location of sites in relation to geology, form and historical factors. To do this effectively a key area was selected for this work which would allow a clearer understanding of the industry in the county. For this purpose the parish of Beith was selected for specific analysis, though general reference was also made to sites in other areas.

The geological distribution of limestone deposits in Ayrshire is well understood (see fig 6.3), in fact "throughout the Midland valley, from north and central Ayrshire through Lanarkshire and Stirlingshire to Fife and the Lothians, it is possible to trace the greater number of individual beds with a high degree of confidence" (Robertson *et al* 1976, 5). There are three main forms of limestone within the county, carboniferous, Ordovician and Old Red Sandstone formations.

Limestone Deposits in Ayrshire

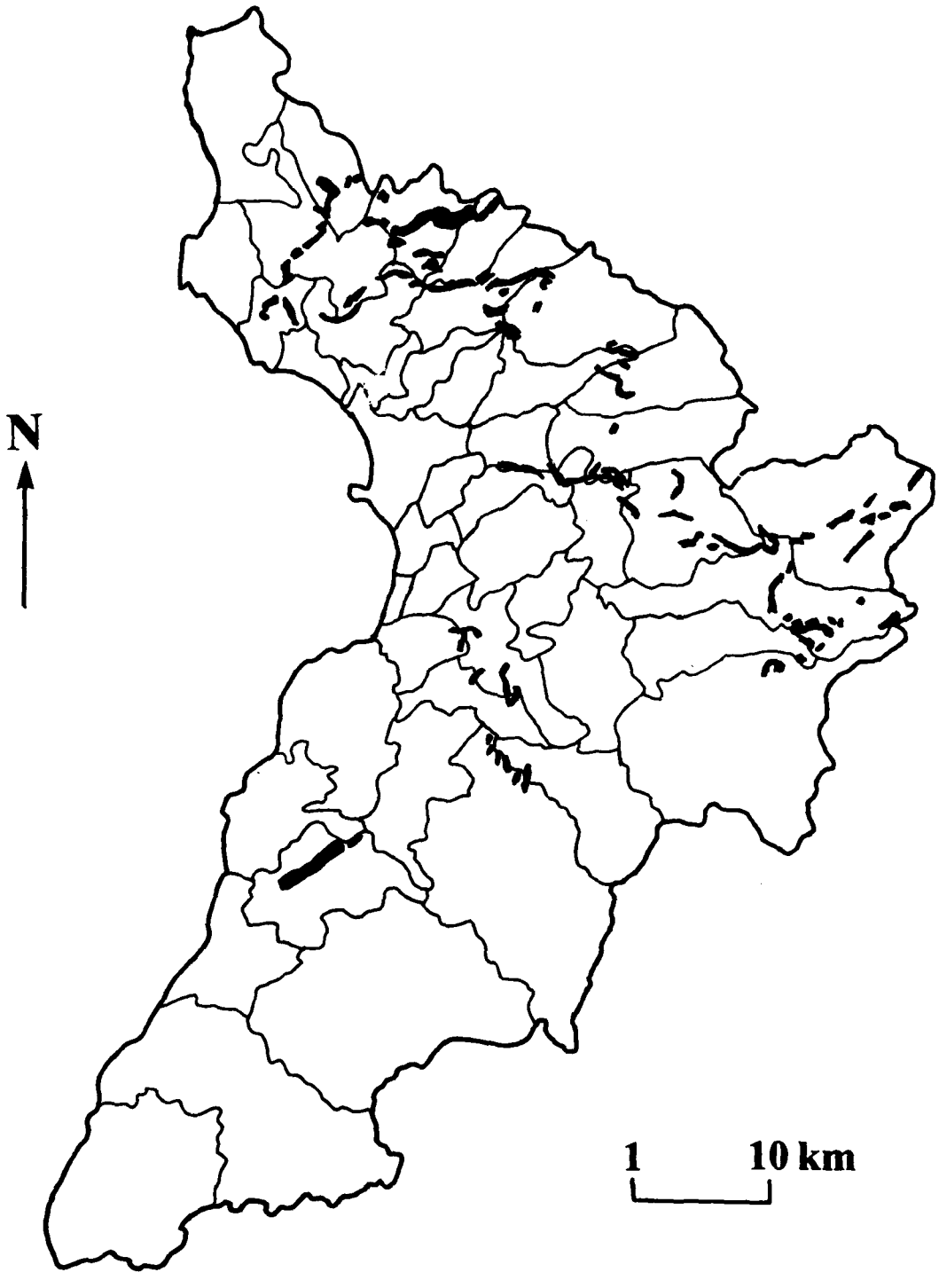

Figure 6.1 Distribution of limestone deposits in Ayrshire

Exploitation of these forms has occurred for agricultural lime throughout the region, though the stratigraphic distribution of each tends to be related to specific areas. The Ordovician sediments are located to the south of Girvan, particularly along the Stinchar valley and have consequently been named Stinchar Limestones. Extraction and processing within this field has occurred on a large scale at a number of locations, notably at Tormitchell, Craighead and Aldons, and smaller scale working occurred at Dularg, Benan Hill and Millenderdale. "The Old Red Sandstone formation is represented in many parts of the county" (Robertson *et al* 1976, 59); this is particularly focused in the area of north Carrick between Girvan and Ayr and as far east as Dalmellington, in the east of the county around Muirkirk and Newmilns and also along the coastal strip between Ardrossan and Wemyss Bay. The seams associated with the Old Red Sandstone deposits are characterised as cornstones and in general represent limestones of a very high quality. Cornstones were worked at a large number of locations particularly in the parishes of Straiton (e.g. Lannielanes and Balgreggan), New Cumnock (e.g. Craigdullyeart) and Muirkirk (e.g. Middlefield). The major deposits of limestone were however the Carboniferous system which were most abundant in the north of the county, especially those parishes to the north of the river Irvine (Beith, Dalry, Kilwinning, Kilbirnie etc.). A second extensive area was worked to the east of the county centred about Muirkirk parish. It is no coincidence that the earliest exploitation of reserves should have occurred within the northern limestone fields. Deposits here tend to have little overburden present and are therefore easily quarried in comparison to the south-eastern fields which have substantial overburdens to contend with.

As would be expected the general distribution of limestone deposits and the sites noted in the first edition series reflect the overwhelming ascendancy of the northern parishes in limestone working, 262 of the 395 sites (66.3%) are located in the sixteen northern parishes. This figure becomes even more focused when the individual parishes are assessed. It is quite clear that the four main parishes (Beith, Dalry, Kilwinning and Stewarton) all have in excess of 30 sites within them and in total represent 168 of the 262 noted sites (64.1%), which means that in global terms these four parishes represent 42.5% of all lime production sites within the county. When it is reflected that there are 46 parishes in Ayrshire the pre-eminence of the four mentioned above for the entire lime industry in the west of Scotland becomes startlingly clear. In comparison the smaller number of parishes within the secondary area of lime working in the county, that is in eastern Ayrshire, reflects a considerable smaller number of sites. For the sake of this comparison this will mean the parishes of Galston, Sorn, Muirkirk, Auchinleck, Old Cumnock, New Cumnock, Straiton and Dalmellington. Only 57 of the 395 sites (14.4%) are located within the eastern extraction fields across the 8 large parishes located there. When it is considered that in Dalry parish alone there are 55 sites the comparison becomes even more vivid. Lime working within central Ayrshire and southern Ayrshire represents even fewer workings.

In central Ayrshire the majority of parishes indicate no lime deposits at all, with parishes such as Monkton and Newton showing no evidence of lime quarrying or lime burning during 1850s. Within other parishes lime burning is noted, even though no quarrying was undertaken. This was clearly the case in parishes such as Ayr,

Tarbolton or Symington where limekilns and old limekilns are noted on their own. As has been noted above, importation of limestone from Ireland as ballast was clearly occurring in the coastal parishes from at least the end of the eighteenth century (see OSA 1790, 42). The coastal parishes also had the ability to supplement manuring by utilising seaweeds and shell-marls. This is reflected in the 1790s account for Monkton parish where the minister states that "the manure used by the farmers near the sea, who have the privilege, is sea ware" (OSA 1791-93, 463). By the 1850s the growth of the road network and development of railways would have allowed greater access to the more inland parishes. Whether this is the reason for the lack of limeburning kilns in parishes like Ochiltree during this period is unclear, though the Statistical Account for the parish written in the 1790s does indicate that limestone "is brought from the neighbouring parishes" (OSA 1792, 504). Given that there are no limekilns evident by 1855, this would suggest that burnt lime, as opposed to limestone, was brought in by this period at least. The most interesting of all the central parishes is Dundonald, where, unlike the adjacent parishes, no limestone deposits were available and few kilns active; this parish had eleven farm kilns, nine of which were still operating in the 1850s.

In the southern portion of the county only 34 of the 395 (8.6%) sites were present, with parishes such as Ballantrae showing no limestone deposits and no known kilns either. What is of interest here though is the scale of production, parishes such as Barr, Girvan, Kirkoswald and Maybole indicate limited agricultural exploitation of limestone reserves and burning, whilst other parishes reveal mass production. This is certainly the case in Colmonell, Dailly and Kirkmichael with 6 of the 20 (30%) major

limeworks in Ayrshire located within these three parishes. With major production sites such as Balgreggan, Auchalton and Todglen in Kirkmichael parish it is not surprising that no active agricultural limekilns were operating within that parish in 1850s. As an interesting aside it is noteworthy that large-scale production was even more intense in the eastern limestone fields with 40% of limeworks located there, which by the 1850s was undoubtedly reflecting the developing ironworks industry within eastern Ayrshire, particularly at Muirkirk, Lugar and Dalmellington.

6.5 Northern Ayrshire: assessment of the data

It is worth noting that the vast majority of the sites in northern Ayrshire recorded in the first edition Ordnance Survey series are clearly small-scale in nature, whether that is extraction or processing in function. Only 5 large-scale limeworks were noted in the overall assessment exercise as against 257 sites in relation to agricultural settlements. For those 257 sites the Ordnance Survey employed a number of descriptive categorisations which can be broadly characterised as Old Limekiln(s), Limekiln(s), Old Quarry (Limestone) and Limestone Quarry. The breakdown of the northern Ayrshire area is defined here as the following parishes:

1. Largs	6. Ardrossan	11. Stevenston	16. Loudoun
2. Kilbirnie	7. Kilwinning	12. Irvine	
3. Dalry	8. Dunlop	13. Dreghorn	
4. West Kilbride	9. Stewarton	14. Kilmaurs	
5. Beith	10. Fenwick	15. Kilmarnock	

Within the above group the numbers of each category of site are as follows, 61 old limekilns, 144 limekilns, 65 old limestone quarries and 64 limestone quarries (**NB** *the numbers do not add up to 257 as many sites have both quarries and kilns present*). The division in nomenclature is assumed to represent sites in and out of use, rather than forms of activity related to particular technologies. That is to say, it is assumed that old limekiln means a limekiln which is no longer in use, rather than a clamp kiln *per se*. Due to the use of this terminology within the first edition series it is possible to develop a relative chronology for the sites identified (see chapter 1 for further discussion). It is quite clear that many of the sites recorded by the Ordnance Survey show different combinations of activity, for example 90 kiln sites were recorded as in use with no sign of a concomitant quarry site nearby, likewise 20 quarry sites were identified with no kilns (in use or otherwise) in the vicinity. This means that any analysis of the data is difficult as the possible combinations of sites can vary so widely, however the table below (see figure 6.4) has been developed to allow the full range of possibilities to be assessed:

Description	*Number*	*Percent*
limekiln(s)	90	35.3
limekiln(s)/limestone quarry	36	14.1
limekiln(s)/old limestone quarry	18	7
limestone quarry	20	7.8
old limekiln(s)	36	14.1
old limekiln(s)/limestone quarry	8	3.1
old limekiln(s)/old limestone quarry	17	6.7
old limestone quarry	30	1.7
Miscellaneous	2	0.8
Total	257	100

Fig 6.4: Table indicating forms of lime quarrying and burning activity as described by the Ordnance Survey between 1855 and 1857

What is clear from the data is the dominance of agricultural liming in northern Ayrshire even after the collapse in the market in the 1820s. With over 35 % of limeburning kilns noted at farms between 1855-6 - the survey years for this area - it would suggest that although the limestone itself must have been purchased from the larger quarries, the actual burning of it was still clearly a local industry. This is a somewhat surprising finding which implies that estates and larger farms which had invested in kilns considered financial rewards to be better in carting stone from a quarry than in quarrying their own stone or buying burnt lime from the larger quarry

companies. Alternatively this may be a reflection of qualitative rather than commercial interests at work. The larger-scale producers, which by this stage were catering more for the burgeoning iron industry and the urban building programmés in Paisley and Glasgow in particular, may not have been producing the quality required for the agricultural market, hence the large number of agricultural limekilns still in use during the period. Although 56% of the northern sites identified had operational kilns, the other important feature is the number of disused kilns at this time. Of the 257 sites 61 old limekilns are noted (23.9%) of the total across the sixteen parishes, though there are clearly differences apparent within the data for each parish. For example in Beith there is a clear association between quarries and kilns at sites in both used and unused conditions, whereas in Dalry the majority of used and unused kilns tend not to have associations with quarrying sites. The difference between these parishes is also reflected in the percentages of kilns being used by the mid-1850s. In Dalry the vast majority (i.e. 77.5%) of kiln sites were operational at this time, a feature which is reflected elsewhere, for example in Stewarton parish which had 84.4% of active kiln sites. This stands in contrast with Beith which has only 31.6% of sites noted as working. In order to assess this further a short field programme was initiated to discern why 13 of the 19 kilns in Beith had already been abandoned by 1855 in a parish where the writer of the Statistical Account only sixty-four years earlier had claimed that "The limestone in this parish is inexhaustible" (OSA 1791, 77).

6.6 The Beith Assessment

The area to the south of Beith, particularly to the south east of the town, was extremely rich in limestone deposits. The principal carboniferous limestones are known by local names and divide into three forms, Upper Linn limestones, Broadstone Limestones and Dockra limestones. Within the assessment area only the Dockra and Broadstone limestones were apparent. All of the 'old limekiln' sites were visited as well as some of the 'limekiln' sites during May 1997, the results are presented in figure 6.5 below. Before the results are discussed it is important to present the aims of the assessment. It was assumed that the terminology used by the Ordnance Survey would not necessarily define form, however it was also recognised that the kilns described as out of use in 1855 were more likely to be of an older form, considering the high proportions of kilns still in use elsewhere in northern Ayrshire. It was also recognised that a proportion may not have survived within the area, considering they existed within the agricultural zone (see chapter 2 for fuller discussion). Finally, the principal role of the assessment was deemed to be a clearer understanding of the mechanics of change within the limestone fields to the south east of Beith. In general the results were very disappointing (see table below):

Site name	*NGR*	*Form*	*Condition*	*Notes*
North Biggart	NS 404 536	clamp	fair	two kilns, one in poor condition
South Biggart	NS 408 531	-	-	filled in by farmer recently
Low Middleton	NS 402 526	-	-	levelled
West Overton	NS 375 534	-	-	levelled
Roughwood	NS 347 522	-	-	destroyed by housing
Over Hessilhead	NS 383 535	draw	poor/fair	Bank of four 18th century kilns, two surviving
Greenhills	NS 374 511	clamp	good	horseshoe kiln with vitrified internal face
Foreside	NS 376 503	-	-	levelled
Burnhouse Bridge	NS 383 508	-	-	filled in 30 years ago
Bungleburn Bridge	NS 380 498	-	-	levelled
Lugtonridge	NS 367 492	-	-	levelled
Broadstone Hall	NS 354 528	-	-	levelled
Crawfield	NS 332 527	-	-	destroyed by housing
Lugtonridge II	NS 367 487	-	-	levelled

Fig 6.5: Table indicating results of assessment of 13 'old limekiln' sites in Beith parish

Only 3 of the 13 sites have survived, the majority being backfilled by farmers as unwanted quarries over the last 140 years. Even in the sites which have survived their future is uncertain. This is particularly the case for North Biggart where the associated quarry in which the kilns are located is being used as a dump at the moment (see figure 6.6). Although a certain degree of loss was expected, the loss of 77% of the sites still visible only 140 years ago is a worrying trend, particularly as a number of them have been eradicated in the recent past (e.g. South Biggart). This was also reflected in the active kiln sites visited, for example at Lyonshields (NS 373 538) the site has recently been levelled. The three surviving sites noted do not allow for any coherent discussion of form as the numbers involved are too small, though the indication would appear to be that 'old limekiln' sites in Beith are generally represented by older forms of kiln (see fig 6.7). The lesson to be learned from this is fairly typical of archaeological lessons within the agricultural zone, only remains on a very large-scale will tend to survive changes in agricultural practice. Limekilns, and in particular clamp or sod kilns, are clearly under threat within the zone of destruction. This has huge ramifications for this class of site. Unlike settlements the very nature of agricultural liming means that sites will tend to be focused away from marginal fringes and are likely to be swept away without being noticed. Although Beith was selected because it had traits which were individual in the sense laid out above, it is equally likely that other parishes within northern Ayrshire will show the same degree of destruction. Although some sites will survive they will tend to be those limekilns which, by their very scale, are difficult to remove; for example the two huge kilns at Nettlehurst (NS 362 504) are still in fairly good condition (see figure 6.8).

Figure 6.6 North Biggart quarry, Beith

Figure 6.7 Greenhill clamp kiln, Beith

Figure 6.8 Nettlehirst kilnbank, Beith

This is a real problem though, as it will lead to an understanding of the archaeology of liming becoming focused through the industrial-scale operations, while the much more prevalent local kilns are poorly understood.

The role of clamp and sod kilns in the transition of the agricultural zone is of critical importance and needs to be fully understood. It is quite clear that the archaeological sources for agricultural liming are a diminishing resource which is likely to vanish before it is properly assessed, never mind understood. Previous work on the lime industry has been limited to say the least, though some authors have noted its importance (e.g. Hume 1976 - identifies 14 important limeworking sites in Scotland). A trawl of the sites held within the *National Monuments Record for Scotland* reveals that only 15 limeworking sites have been recorded for the entire county of Ayrshire. The focus is primarily on the large-scale production sites at the expense of the agricultural kilns. Nearly 50% of the sites referred to are limeworks with only three agricultural kilns noted and one horseshoe clamp kiln site (Harwood Burn, Muirkirk). The two most interesting sites (Bonshaw Farm and High Langside) are those which potentially could be the earliest, however, both sites have tended to be viewed in an unconvincing and uncritical manner, particularly Bonshaw Farm where three kilns have been suggested. A short discussion of the Bonshaw sites follows to elucidate the point. The first of the possible kilns is known as Hutt Knowe and is located to the west of Bonshaw Farm at NS 3754 4415: the site has recently been identified by the RCAHMS as a possible barrow or cairn (NMRS NS 34 SE 2, 1982). Inspection of the mound which is positioned prominently and measures 17 m in diameter and stands some 2.3 m high would appear to confirm this is an unlikely candidate for a limekiln.

However close inspection revealed burnt limestone eroding out of the southern and northern faces of the mound in areas of sheep damage. This would therefore appear to support Feacham's earlier assertion that the site may represent a kiln (1959). Prior to this Smith had stated that two drystone culverts were visible penetrating the eastern side of the mound (1895), which may also give some support to it being a large kiln. However without excavation the site cannot be categorically confirmed as a limekiln. The second site (at NS 3772 4417) which is located by the track to the east of the Hutt Knowe is clearly a limekiln, circular in shape and built of stone and turf, it has drystone internal walls which show vitrification (similar to the Greenhills horseshoe clamp kiln in that respect). Although it represents an unusual form of clamp kiln (i.e. circular instead of horseshoe in shape) the site was still functioning by 1855 (Ordnance Survey, sheet 12) and is therefore unlikely to be of any antiquity (see fig 6.9). The third possible kiln is located to the north east of the current steading (at NS 378 444) and lies in close proximity to the farm buildings erected in 1775. Like Hutt Knowe this site is also represented by a mound some 8 m in diameter and standing to 2.3 m high. Interestingly, the mound also has a culverted entrance on the southern side, though its general location would appear to mitigate against it operating as a limekiln. The mound and surrounding area have been planted with a wide range of exotic mature trees which may imply it fell out of use prior to the building of the current farmstead. This is in principal supported by local history which indicates that the site was the location of the Barony of Bolingshaw, which was disbanded as a punishment after the failure of the Jacobite rising in 1745-6. Although the current proprietor believes that the site represents an ice house which was associated with the

pre-1745 manor house, it could equally be a kiln of some kind. Once again, without excavation, this will need to remain a possibility.

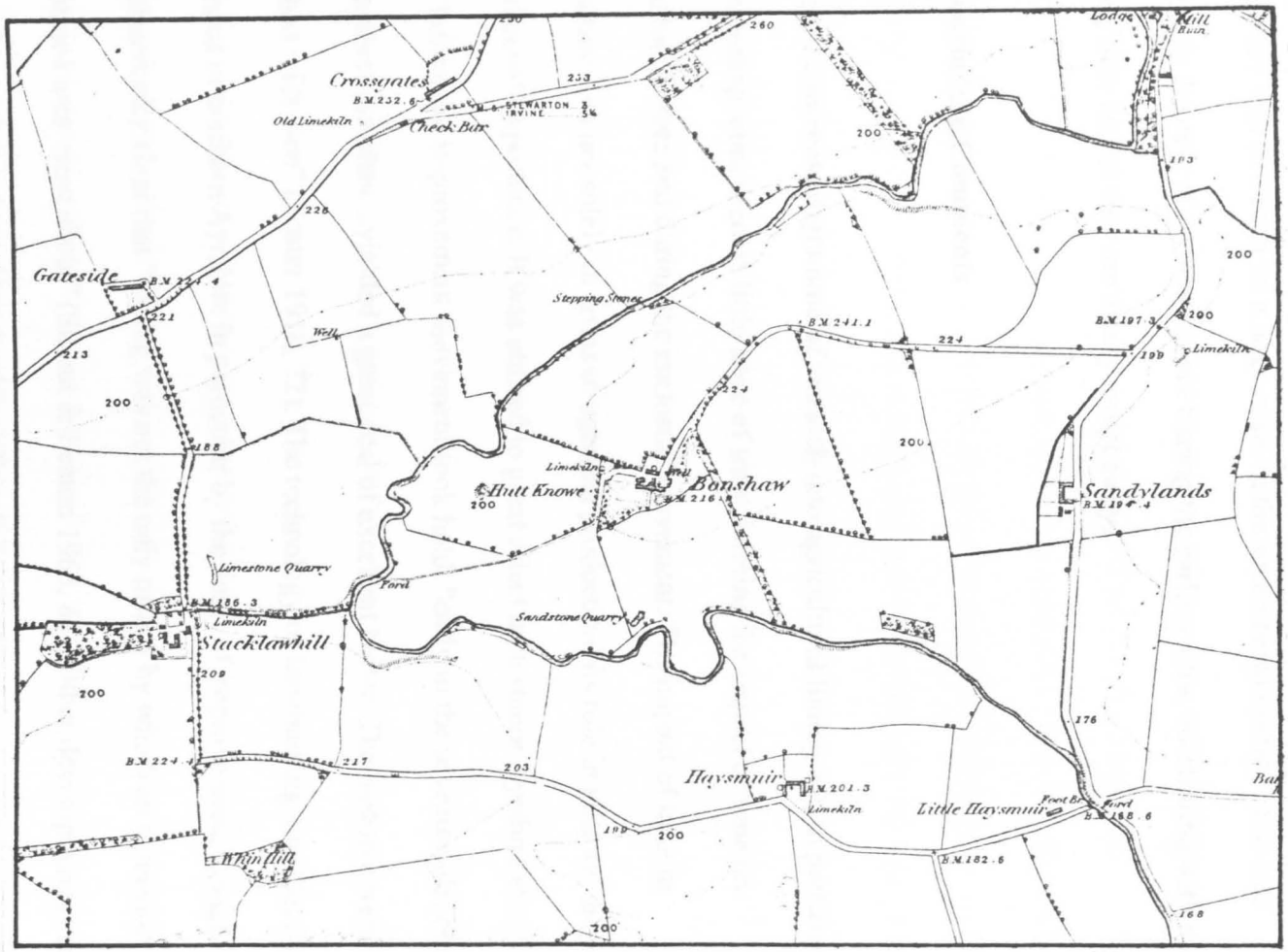

Figure 6.9 Ordnance Survey plan of Bonshaw Farm, 1855

Whether the kilns at Bonshaw or High Langside actually represent some of the earliest lime production sites or not is clearly debatable. It is quite clear that lime production for agriculture was a significant development of the Ayrshire economy prior to the 1750s. As elsewhere in Scotland, England and Wales the development of the industry was first seen on a large-scale in the seventeenth century. The real problem in the case of Ayrshire is not tracing the earliest sites, but dealing with the existing sites before they are totally swept away.

6.7 Concluding Comments

Without a coherent programme of research into agricultural liming and in particular the remaining sites, there is little hope of truly defining the impact of lime on agriculture before and during the enclosure movement. The impact of lime in agriculture was not solely in terms of agrarian production, its role in pastoral areas was of equal importance. It was utilised to great effect in northern Ayrshire over 100 years before the improvement movement took hold: "early in the seventeenth century the northern parishes....yielded a great deal of excellent butter. The pastures were enriched with lime" (Foster 1910, 72). The technology of limeburning was clearly advanced in northern Ayrshire in particular by the onset of improvement, though it is also abundantly clear that "liming was not the only means by which an extension of the farmed area came about" (Smout & Fenton 1965, 84). Other developments such as changes in crop rotations, introductions of enclosure and drainage programmes all had an important part to play. It has not been the aim here to present the archaeology of lime as somehow different to other archaeology's of improvement, on the contrary,

drainage tile production prior to the 1850s is an even less understood industry. What does make liming stand apart though is its pedigree of use, liming was being utilised from as early as the 1520s in Ayrshire and may well have been utilised much earlier. The evidence from English archaeology suggests that the business of limeburning was understood much earlier, even though most commentators have implied that early production was related to the production of lime mortars rather than for agricultural use. It is also equally likely that in an almost exclusively rural setting such as Ayrshire prior to the improvements, any limeburning would need to be utilised for both mortar and agricultural purposes, given the problems in transportation in the region. Certainly by the 1740s the growth of the lime industry in the western lowlands was one of the clear enabling factors which allowed yields to increase and underwrote the reclamation of not only outfield, but also marginal and poor quality land as well. As Colonel William Fullarton summarised it:

> "the county possessed within itself the means of improvement in a superior degree. Extensive tracts of very rich and valuable land; abundance of coal and lime, almost in every quarter" (Fullarton 1793, 14-16).

The role of agricultural lime has been expressed above as a central feature of the improvements in lowland Scotland between the 1740s and the 1880s when the market finally collapsed. Its importance was not only in the leverage it gave to expanding agriculture, but also in the demand for coal it necessitated, which in turn helped to support the burgeoning coal industry. Agricultural liming has tended to be overlooked in the period of its greatest success, a feature which this chapter has attempted to

question. Like most industries which operate in rural contexts and individually are small-scale in outlook, lime has tended to be ignored in favour of more glamorous entrepreneurial ventures such as ironworking. Although there has been more interest of late in the lime industry south of the border with the development of the *Monuments Protection Programme* (MPP) for lime and stone industries, little interest has been expressed within the Scottish context. It is vividly clear from the small-scale analysis undertaken here that the industry in general, and agricultural liming in particular, still lacks a coherent position within the history of industrialisation in the rural lowlands. It is argued here that this has led to a misunderstanding of the period of comprehensive change within the historic landscape, especially the period 1750 to 1850; a misunderstanding that will only be reversed when clearer national priorities are expressed.

Chapter 7

Iron, Coal and the Industrial Settlement Pattern

7.1 Introduction

In previous chapters the impact of the iron industry and its associated extractive industries have been briefly discussed. It is now time to undertake a closer analysis of the development of iron working in the county and the impact it had upon the rural settlement pattern. The role of iron-making, ironstone mining and coal mining in particular altered the face of the countryside from as early as the late eighteenth century and more particularly from 1850 onwards. The development of a particular class of dwelling to house the workers was a key feature of the changes associated with large-scale entrepreneurial investment in the rural sector. That investment also led to a transformation in the very fabric of the landscape, which left an indelible pattern of exploitation on the Ayrshire landscape. This pattern can still be seen today at a number of locations, especially in relation to the larger ironworking sites such as Muirkirk and Dalmellington and within their associated mining townships. A key aim of this chapter will be to assess those sites and develop an understanding of change and transformation and relate that to the changes visible in settlement patterns. Although some authors have already written substantially about the mining and iron-working landscapes of Ayrshire (e.g. Hume & Butt 1966; Campbell 1966; Whatley 1975; 1983) their analysis has tended to be focused in economic history terms. Although economic and social history will be referred to here, the main purpose is to view the archaeology of mass production via the remains of the settlement pattern.

7.2 The background to iron production in Scotland

Iron production in Scotland prior to the early seventeenth century was effectively a small-scale enterprise. The making of iron in bloomery furnaces has left a poorly understood legacy of archaeological remains which are in general focused in upland marginal zones with few known examples in the lowland agricultural belt. Until recently little coherent archaeological or historical work has been undertaken in relation to the bloomery mounds of this country (see Atkinson & Photos-Jones 1995; Photos-Jones *et al* forthcoming; Atkinson & Photos-Jones 1997 for further discussion). Work by MacAdam in the 1880s indicated substantial groups of bloomeries spread throughout the Highland zone, and especially in Argyll, Bute, Sutherland, Ross and Moray (1887). In the twentieth century little additional information was collected, though Aitken in the early 1970s indicated substantial groups of bloomery sites in Loch Rannoch, Tayside and confirmed the existence of the Argyll group (1973). Further analysis of the distribution of known bloomery sites since 1995 indicates groupings in areas where amateur interest has been focused, particularly in Argyll and Ardnamurchan (Atkinson & Photos-Jones forthcoming). Few sites have been noted within the *National Monuments Record for Scotland* (NMRS) outside the Highlands, though a small number have been identified in the borders, particularly in upland Galloway. So far "bloomery iron production of the Medieval period appears to have left few traces within primary documents or manuscripts" (Atkinson & Photos-Jones 1997, 5). This could be seen as a predictable course of events, as the very nature and small scale of the activity is less likely to be discussed at a national level. Historical documents may exist within estate collections

which will contradict this statement in the future, however for the moment early iron production in Scotland does not have a perceptible contemporary historical background. Further understanding of early iron production in Scotland "depends less on formal documentary research and more upon the use of the techniques of classical archaeology, especially excavation" (Butt 1966, 194). Although programmes of excavation have recently been undertaken in the Highlands as part of the Historic Scotland-funded Bloomery Mounds Project (Atkinson & Photos-Jones 1995; 1997; Photos-Jones *et al* forthcoming) lack of comparable data is still a major problem. Recent excavations at Tamheich Burn and Allt na Ceardaich, Argyll indicate different forms of bloomery being utilised during the Medieval period, with the Allt na Ceardaich site giving a date of AD 1468-1648 (GU-4415) for its final firing. This has been complimented by Wordsworth who has attained dates in the thirteenth and fourteenth centuries from a group of bloomery slag heaps in Inverness-shire in the recent past (J Wordsworth *pers comm*), however as yet no chronologically-based typology can be derived.

The development of larger-scale production in the iron industry did not 'take-off' in Scotland until the early 1600s with the founding of three furnaces in Wester Ross centred around Loch Maree. This enterprise which was established by Sir George Hay of Nethercliff around 1610 and continued after a short break in production by the Earl of Seaforth in the late 1620s was developed to produce Ordnance (canon and shot) for the Crown. The venture clearly had substantial problems, not least of which was the importation of ore from Fife and Cumbria, and was probably finally abandoned in the 1680s (see Lindsay 1977). The industry had relied upon skilled English workmen to

produce iron in the far north and was partially underwritten by English entrepreneurs such as Nathaniel Edward and James Galloway, a feature which remained a central issue in iron-making in this country into the nineteenth century (cf. Butt 1976, 75). The Loch Maree venture was, however, something of a one-off in terms of production. Although occasional references are made to other ironworks being established in Fife, Loch Carron and even Lewis, there is no strong archaeological or historical evidence to support this. Evidence from excavations at two of the Loch Maree sites (Hume & Tabraham 1979; Lewis 1984; Atkinson & Photos-Jones 1997) would seem to suggest a fairly grand scale to the early seventeenth century venture, particularly at Fasagh where a substantial forge complex was established, however this simply reflects investment rather than success of the industry. In reality production of iron for domestic use in seventeenth century Scotland was probably still undertaken by small-scale craftsmen working bloomery furnaces. Any requirements for large quantities of bar iron products were met by foreign producers and imported from Scandinavia in particular (cf. Butt 1976). The importation of iron during this period and well into the eighteenth century still formed a central feature of the industry in Scotland which remained until the establishment of the Carron Ironworks in 1759. Carron was not the first works to be established in the eighteenth century though, earlier charcoal-fired furnaces were worked in the Highlands from 1729 onwards (Leneman 1981, 7): it is at this period that the first attempts were made to establish an ironworks in Ayrshire.

7.3 Iron working in Ayrshire from the eighteenth century onwards

The iron production and coal mining industries prior to the eighteenth century in Ayrshire were separate and apparently unrelated ventures. As has been shown in chapter 2 the pedigree of coal production in the county was clearly established long before the 'take-off' in iron working. Prior to the end of the eighteenth century the main markets for Ayrshire coal were Ireland (cf. Duckham 1970; Whatley 1975; Cochran 1985) with local consumption restricted in the main to salt production in northern Ayrshire and the burgeoning lime industry. Although the first half of the eighteenth century saw investment in the iron industry in the county, that development was related to charcoal-fired furnaces rather than coal-fired production. The development of the Terreoch iron works in eastern Ayrshire around 1730 has attracted some attention, though its history is shrouded in confusion. Hume and Butt appear to suggest that the ironworks was flourishing up until the early 1780s (1967, 162) at which point Lord Cathcart was undertaking mining operations with the aim of exporting ore to Bonawe furnace in Argyll. On the other hand it has been suggested that the site was solely used to process iron rather than produce it (Baird 1940, 23-24). In this scenario haematite ore was mined locally along the Pennel Burn then shipped to Bonawe where it was turned into pig iron; it was then shipped back to Terreoch where it was converted into wrought iron (Findlay 1980, 11). If Findlay is correct and the Terreoch works was "built solely to convert pig iron into wrought iron" (1980, 11) then the site plan should reflect its use as a forge rather than ironworks. Inspection of the site reveals a fairly substantial enterprise with water channels leading in from the River Ayr and one main furnace represented by a large mound some 9 m in diameter

by 3 m high (see fig 7.1). Although there are some similarities with the charcoal-blast furnace at Red Smiddy, the scale of the Terreoch furnace would appear to suggest a larger-scale of production. The internal measurements indicate a bowl of 1.40 m in size, though the poor condition of the furnace bowl, with no lining apparent, means that no clear definition is possible. The crucial factor for the works would have been the location of the water-driven hammer or hammers to work the wrought iron. The topography of site itself restricts the possible locations for this and in reality may preclude the existence of a large forge area. The limited space available around the furnace mound and the fact that the major feature of the works is a large furnace would seem to contradict Baird's and Findlay's suggestion. If the works was simply functioning as a forge then there would be no need for such a massive furnace. Without further detailed archaeological and historical investigations the site will remain something of an anomaly amongst the other ironworks in the county.

Figure 7.1 Terreoch Furnace, Auchinleck

The closure of Terreoch was followed by the development of one of the major entrepreneurial ventures in the Scottish iron industry, the founding of Muirkirk Ironworks (see fig 7.2). The history of the works has been dealt with in some detail already (e.g. see Donnachie and Butt 1965; Hume and Butt 1966), however it is worthwhile outlining the main features of development here. The site of the Muirkirk works was located in a previously undisturbed upland agricultural landscape known as Garranhill in the eastern fringes of the county. The first industrial developments were however not related to iron production but the setting up of 46 tar kilns by the British Tar Company in 1786 "to work Lord Dundonald's patent for the manufacture of tar, lamp-black and varnish from coal" (Hume & Butt 1966, 162) (see fig 7.3). The source of coal to be utilised came from the nearby Kaimes colliery and was leased from a local laird that same year. Whilst the tar works were developing plans were also well ahead for an ironworks at Muirkirk and the first blast furnace was under construction by 1787. The Muirkirk Iron Company was investing both in plant and machinery during this period and by 1788 had built-up a considerable stock of ironstone by opening six ironstone mines in the Glenbuck area. It was also recognised that there would be no shortage of limestone, though coal deposits were still a problem. By 1789 the Muirkirk Iron Company had taken over the Kaimes colliery in the wake of the failure of the Catchyburn workings to produce enough coal for the ironworks. In July of the same year production on a significant scale was begun and in 1791 a second furnace was in blast. Although there were technical difficulties in 1792 "by 1793 the influence of the ironworks on Muirkirk parish was very significant" (Hume and Butt 1966, 177).

3441 no. | name MUIRKIRK IRONWORKS

Figure 7.2 Muirkirk ironworks c 1840 (source: RCAHMS)

no.	name
B47124	KAMES
	MINING REMAINS; TARWORKS
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Figure 7.3 Tar works and associated landscape, Muirkirk (source: RCAHMS)

Although the works functioned and produced high quality bar iron from this point until its final closure in 1923 there were still difficulties to overcome in the early years of production, notably the attracting of workers to the area and the lack of a transport infrastructure. The workers will be dealt with further below, but for the moment it is important to reflect on the transportation problems. The location of the Muirkirk ironworks is the classic example of early industry being established in an area devoid of infrastructure, though rich in resources. The relationship between the British Tar Company and the Muirkirk Iron Company was an important feature here. J L MacAdam (of *Tarmacadam* fame) was the agent for the British Tar Company from 1788 onwards, his influence was crucial and "no doubt aided the local growth of communications, in particular, turnpike roads from Glasgow to Dumfries and the lateral road from Glenbuck to Ayr which were designed to cross each other at Muirkirk" (Donnachie & Butt 1965, 218). By the end of the eighteenth century a second ironworks was under construction at Glenbuck, although no exact date can be given for its foundation "it seems most likely that furnace building began in the summer of 1796" (Butt 1969, 69). Glenbuck was clearly not as successful as Muirkirk however, lasting for under twenty years it had ceased to operate by 1813.

In some ways the failure of Glenbuck was relatively unusual in comparison to the success of iron-masters in Ayrshire in the nineteenth century, having said that eleven other ironworks met with similar early ends including the ill-fated Blair ironworks in Dalry. The rapid growth of the iron industry in the county particularly from 1840 onwards has already been dealt with in chapter two above, though it is worthwhile summarising in the context of this chapter. The scale of developments within the iron industry during the nineteenth century was spectacular to say the least, which by

extension was reflected in the effects on the rural communities which serviced them. Campbell (1966) has assessed the developments in Scotland as occurring in three main phases with the main phase of expansion occurring between 1828 and 1871. During this secondary phase of iron working the number of furnaces increased exponentially from four in 1830 to forty-eight in 1873. Whatley has analysed the full pattern in relation to Ayrshire (see fig below) and concluded that the beginnings of development were in fact later than the general picture reflected in Lanarkshire for instance:

> "The establishment of furnaces at Cessnock and Dalry in 1838 and 1839 respectively marks the beginning of a major new phase in the history of both the county's coal and iron industries" (Whatley 1975, 288; 1983, 64).

Year	*Furnaces*
1789	1
1790	2
1801	4
1830	3
1843	12
1846	21
1848	28
1849	30
1854	41
1873	48

Fig 7.4: Increase in furnaces in Ayrshire during eighteenth and nineteenth centuries (source: Whatley 1975, table V, 1, page 216)

Quite clearly the major period of impact occurred between 1840 and 1873, which by extension is the period when the alteration to the settlement pattern in relation to iron production and coal mining increased dramatically. In consequence much of the rest of the chapter will focus on changes in settlement organisation during this phase.

7.4 A changing settlement pattern: understanding the 'model' house

The changes which occurred in the countryside during the Industrial Revolution led inexorably to an abandonment of vernacular regimes and the establishment of industrial settlements on a grand scale. One of the key developments in that transition

was the migration of surplus agricultural workers from communities in pastoral and agrarian areas, particularly in southern Ayrshire. That out-migration from southern and eastern parts of the county was also reflected in an in-migration into the industrial heartland of northern Ayrshire (see chapter 2 for full discussion). Although there is no direct relationship between population change in these areas, in other words the burgeoning industrial communities of the north were not filled with agricultural labourers from the south, a complicated demographic change was occurring. This series of events led to "two main phases of village building by manufacturers at the end of the eighteenth century and in the middle of the nineteenth century" (Gauldie 1974, 59). The first phase of building was characterised by a philanthropic need in entrepreneurs to provide good quality 'model' housing for their workers. The term 'model' housing is used here to define purpose-built accommodation, constructed to a set layout and plan to house industrial workers, by landowners or entrepreneurs. Gaskell has argued that the theoretical structure that led to the development of 'model' housing owed much to the writings of Viscount Francis Bacon and Sir Thomas More in the sixteenth century with a clear "emphasis on equality, social co-operation and physical order reflected in the division of urban settlement into regular sections with uniform houses" (1987 4). Whether this was the main impetus for the construction of 'model' industrial housing in the mid-eighteenth century onwards, or not, is unclear, though a clear movement towards uniformity in industrial housing by the late eighteenth century in Scotland was certainly occurring. The classic example is of course David Dale's New Lanark, though his earlier village at Catrine in Ayrshire was equally uniform in nature, but constructed to a more rural scale. Dale's interest was not purely philanthropic however, the economic reality of establishing large

spinning factories in the countryside was undertaken for sound commercial reasons. As Smout has indicated:

> "Places like New Lanark, Ballindalloch, Deanston, Catrine and Blantyre, were situated so as to tap the cheap labour of the agricultural communities and to sell yarn to the weaving areas nearby" (Smout 1987, 236).

The cotton industry was a very particular case however in Ayrshire, the expansion of other industries in the second half of the eighteenth century does not seem to have provoked the construction of a specific class of planned village community to the same degree. With regard to coal mining settlements for instance, there are few references to the form of their dwellings during the eighteenth century. Most commentators have concentrated their efforts on detailing the social position of colliers with only passing reference to the forms of housing they occupied. The fact that colliers were held in bonds of serfdom until 1799 and were therefore viewed in contemporary eyes as the lowest form of industrial workers has tended to mean that little interest in the communities has been forthcoming. When houses are referred to, it tends to be discussions of the conditions of the mining communities rather than the type of dwelling that is discussed (see Duckham 1969, 186 for example). Occasionally some authors mention the structures themselves, for example Bremner in a lengthy passage indicates that:

> "For the most part miners reside in houses specially built for their accommodation in the vicinity of the collieries. In the early days of coal

mining the houses were of the most wretched description; and even yet a large proportion of them are deficient in the ordinary requisites of human habitations" (Bremner 1869, 26).

He goes on to discuss the case in Lanarkshire where he suggests that:

"A great majority of the miners' houses are of a very poor kind, and many of them have only one apartment. They are arranged either in closely built rows or confined squares, and the people are literally huddled together in them" (Bremner 1869, 29).

If provision of housing is taken as an indication of status then mining communities were clearly viewed as a different class from other workers in late eighteenth century Scotland. This is clearly reflected at Muirkirk where provision of housing for iron workers and miners indicates a division in quality and cost of construction. Hume and Butt confirm this by indicating that:

"Not-so-subtle gradations between workmen account for the differences in cost, since furnacemen got better class accommodation entirely than colliers. Colliers' houses were thatched; furnacemen's houses were slated and roofed with foreign timbers" (Hume & Butt 1966, 177).

Ayrshire miners' settlements will be explored further below, however for the moment it is the intention to turn back to the central theme of 'model' housing. One of the

clear characteristics of the changing settlement pattern in Scotland was the rise of specific forms of settlement within the landscape. The principle example of this was the development of miners' rows in relation to extraction sites in areas where no settlement had previously existed (see fig 7.5). The particular form of building in rows or in squares, a feature which was common in the Lothians and Lanarkshire, needs some further attention. A number of authors have proposed that 'model' housing developed to house workers came into prominence in the mid-eighteenth to late eighteenth century (Burnett 1986; Chapman 1971; Gaskell 1987; Gauldie 1974). Although this is clearly an attractive scenario, and "the spread of pattern books, standardising building forms and techniques, while suppressing the vernacular traditions" (Gaskell 1987, 6) was clearly occurring, this is also a generalisation. The change of form was undoubtedly accelerated during this period, a feature which is also replicated in farm transition (see Fenton & Walker 1985), but examples are also clearly visible which contradict the model. Duckham for instance indicates a turf-roofed miners' row at Low Quarter in Lanarkshire which was photographed in the late nineteenth century, but was actually constructed two hundred years earlier (Duckham 1970, 232) (see fig 7.6). In contrast the Eglinton estate plan books indicate two miners' settlements at Coalhill and Longford in Ayrshire in 1789 which reveal that the form of the collier's houses was based on cottages rather than rows (see fig 7.7). In reality change was not linear, it had more to do with particular landowners or coal-masters than the availability of pattern books, "everything depended on the attitude of the coal-owner or leasee and on the economic context of operations" (Duckham 1969, 185).

B47139 no.	name MARCH BURN	NETHER WELLWOOD
	ENCLOSURES	MINING REMAINS
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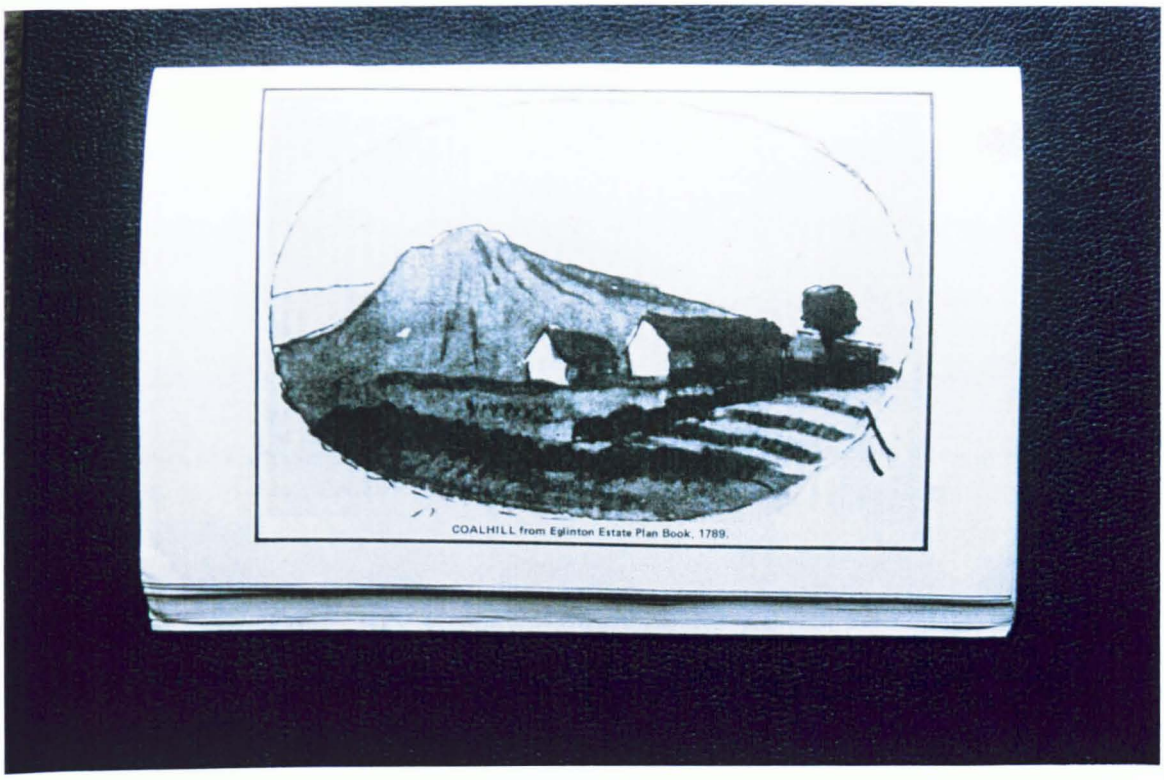
Figure 7.5 Powharnal Row, Muirkirk (source: RCAHMS)

Figure 7.6 Turfed roofed miners row at Quarter, Lanarkshire (source: Duckham 1970)



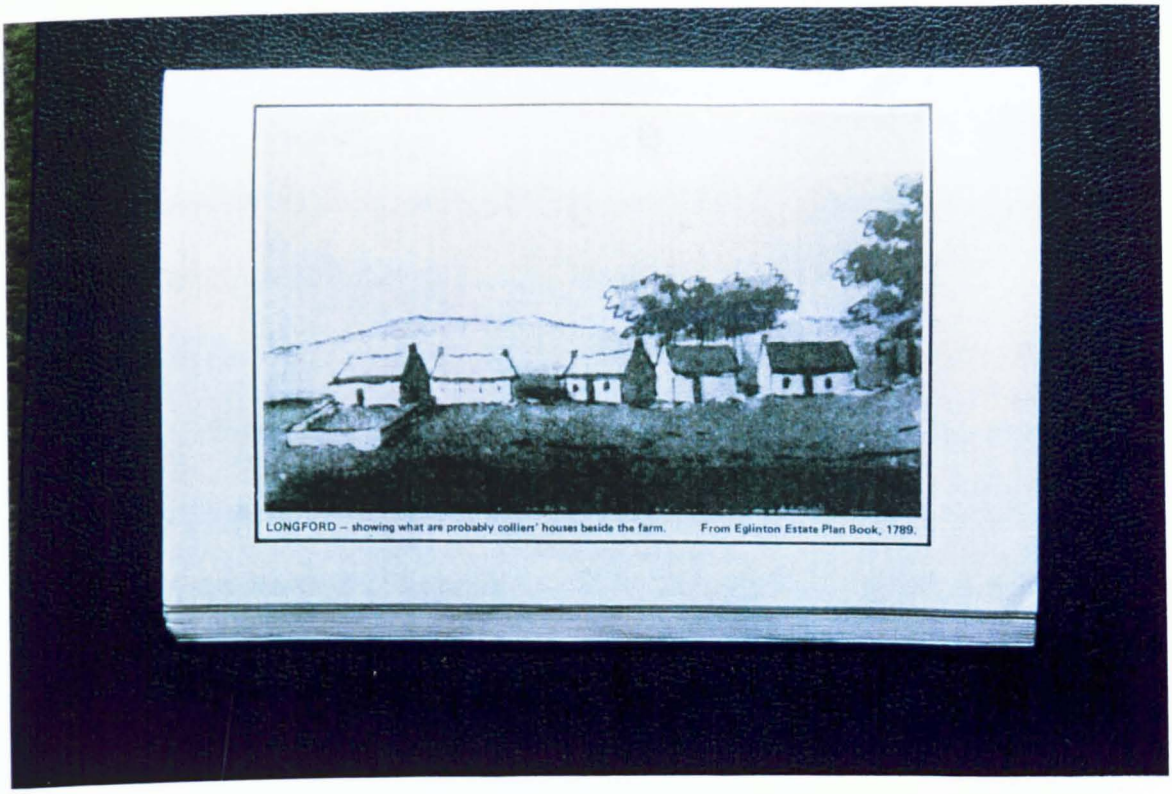


Figure 7.7 Coalhill and Longford miners settlements, Ayrshire (source: Whatley 1983)

What may have given the added impetus to industrial entrepreneurs to build in particular forms however, was the increasing availability of cheap materials, such as brick and local stone and the economic framework of landownership in Scotland. Burnett has summarised the position as follows: "landowners appear to have discouraged coal-owners from providing anything more than minimal shelter" (1986, 82-3). The reason for this approach was probably due to the fact that leasing coal rights from landowners for underground workings did not extend to over-ground activities, therefore it made economic sense for coal-owners to pay ground rent on the smallest area necessary to house their workers. As Gauldie has suggested in relation to the English mining areas:

> "The coal-owners interest was in the underground workings only. He did not feel himself responsible for the land above, and in fact, was discouraged from taking an interest in it by his landlord's tendency to fix on him, as ground rent, an exorbitant additional charge for the privilege of having on the surface of the ground a decent and comfortable village" (Gauldie 1974, 65)

In Scotland, although the leasing of coal workings was not such a predominant feature of the industry as it was in England, the development of rows was clearly a significant feature. The combination of economic necessity and availability of cheap materials in bulk from the burgeoning brick and tile industry particularly after 1830 did lead to the formulaic building of workers accommodation in the countryside. After all, "in industrial settlement the intention was, of course, to make a profit" (Gauldie 1974,

58). However, there was a third feature, that is location, which was particularly important in this development.

The location of settlements during industrialisation as has been indicated above in the case of Muirkirk owed little to existing communities and services and much to the availability of raw materials. Iron works and coal mines were established with the primary aim of accessing mineral wealth wherever it could be found. In reality it was cheaper to attract workers to an area by offering housing than it was to take the raw materials to the people. This of course led to construction of the cheapest housing possible for workforces that were viewed as disposable, and more expensive housing for skilled workers. The example of Muirkirk above is clear enough in this respect, the skilled furnacemen who were attracted to the area from Muirkirk Iron Company's sister works (Edington's Clyde Ironworks) or from as far away as England were kept there by the provision of quality housing in Catchyburn Square, whilst the mining population was provided with subsistence accommodation. The key factors in the case of the miners, particularly the coal hewers, were undoubtedly skill factor and the fact that miner's mobility was high. Campbell summarises the position by quoting Daniel Callaghan of the Children's Employment Commission in 1842:

> "The migratory character of the mining and colliery population is to be ascribed partly to the tenure on which they hold their houses....The people thus feel themselves wholly unconnected with the place" (Campbell 1979, 165).

The construction and leasing of accommodation, particularly miners' houses, reflected their social position in the early nineteenth century. Although they were a fundamental part of the iron industry the iron-masters viewed them as disposable labour which could be utilised or dispensed with at will. This, of course, was reflected in the quality and cost of housing provided. That cost ratio was reflected in the case of some companies even in the raw materials for the construction of miners' housing, for example the Dalmellington Iron Company who had their own brickworks at Waterside constructed villages like Corbie Craigs by utilising their own products.

7.5 Industrial housing in Ayrshire: the case of the ironworks and associated mining communities

Archaeological investigations into industrial housing have tended to be limited to say the least. Although a substantial body of research into industrial settlement forms exists in England, that focus is primarily on industries functioning within townscapes (e.g. Leach 1981; Morgan 1990). In general these studies have tended to focus on upstanding remains with few examples of excavation, though recent work by Morris in relation to navvy settlements in northern England has highlighted the possibility of qualitative results from excavations on temporary industrial settlements (see Morris 1994). In Scotland the position is even less worthy of comment as the archaeology of industrial communities has achieved little interest to date. As a starting point for investigation it is the intention within this work to view the development of industrial settlements in Ayrshire by considering the surviving evidence from a number of sites. This programme of assessment was based around the premise that the inter-

relationship between the expanding iron industry of the mid-1850s and its relationship with coal and ironstone mining and limestone quarrying should allow a primary understanding of the industrial settlement pattern. Inspection of the Ordnance Survey first series (1855-57) maps for the county revealed nine functioning ironworks (see fig 7.8 below) and associated landscapes, however comparison with the modern edition series confirmed that in the case of sites such as Blair, Eglinton and Glengarnock redevelopment had eradicated these sites and much of their associated workings. In consequence assessment was focused on the three landscapes which had survived in reasonable condition (i.e. Muirkirk, Dalmellington and Lugar). The approach utilised was to visit the settlement sites recorded on the first edition series (OS 1855-1857) and assess them by means of written record and sketch plans to include size of structures and number of compartments, together with a photographic record where applicable. A proforma recording sheet was developed for this purpose to allow a standardised approach to the sites (see fig 7.9 for example of proforma sheet relating to Muirkirk ironworks; site 007 - Linkyburn Square).

Name of works	*Owners*	*Furnaces built*	*Furnaces in blast*
Ardeer	Merry & Cunningham	4	2
Blair	Eglinton Iron Co	5	2
Eglinton	Eglinton Iron Co	5	5
Dalmellington	Dalmellington Iron Co	4	4
Glengarnock	Merry & Cunningham	9	9
Lugar	Trustees of John Wilson	4	0

Muirkirk	Trustees of John Wilson	3	3
New Cumnock	New Cumnock Iron Co	3	2
Portland	Portland Iron Co	4	3

Fig 7.8: Location of ironworks in Ayrshire c. 1854 (source: Campbell 1979, table 4.1, page 94-95)

Figure 7.9 Example of proforma recording sheet

Industrial Settlements - Proforma Sheet

Site	Code	Map No
MUIRKIRK I W	007	NS62NE

Name	NGR	Industry
LINKYBURN SQUARE	NS696 264	IRON

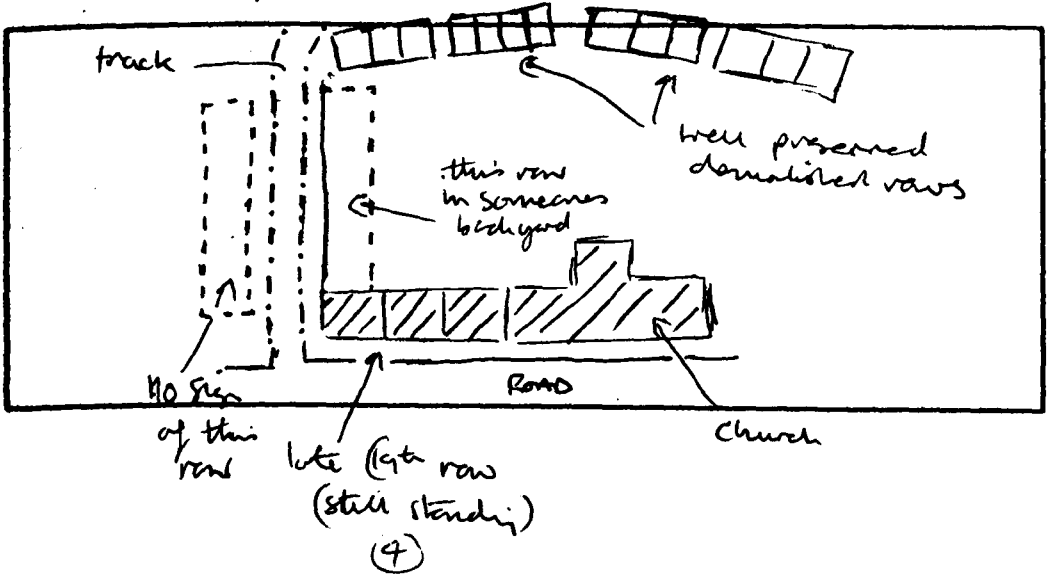
No of Buildings	Alignment	Compartments
4+	varies	3's & 4's

Dimensions	Hearth	Entrance
6 × 4 m each comp.	—	varies, but always into the square

Description

Substantial group of Ironworkers houses associated with Muirkirk Ironworks. Late C18 examples still standing, however majority of early houses now demolished. Two rows at back of settlement survive. One (SW) has two blocks divided by 1.5 m breeze and entrance to the north & each compartment. Made up of two groups of three compartments. The second group (SE) has two blocks divided by 1.5 m breeze the western most has 4 comp and the eastern most 3. Wall thickness of 0.3–4 m, constructed of ashlar blocks with some brick present. Rough casting on exterior also visible where concrete floors.

Notes



In the case of Muirkirk, although the furnace bank (see fig 7.10) and much of the associated miners' rows in the area of Kames (see fig 7.11) were demolished in the late 1960s a substantial proportion of the settlement landscape has remained relatively unaltered. This is particularly the case to the south and south west of the River Ayr, in consequence assessment was undertaken in this area (see fig 7.12). Seven sites of interest were noted within the assessment area, details of which are given below:

The Royal Commission on the Ancient & Historical Monuments of Scotland: National Monuments Record of Scotland

	NS62NE 17	St region	county	AYRSHIRE
1966/ date	NGR 69 7 268	CD district	parish	MUIRKIRK
B 83836/PO no.	name MUIRKIRK IRONWORKS			
B 83837/PO	Furnace bank and engine house. Demolished 1968.			
	©, and permission to reproduce, from: Dr Trevor Rees (upper)			

Figure 7.10 Furnace bank prior to demolition at Muirkirk (source: RCAHMS)

The Royal Commission on the Ancient & Historical Monuments of Scotland. National Monuments Record of Scotland

	NS62NE 43	St region	county AYRSHIRE
1965 date	NGR 692 262	CD district	parish MUIRKIRK
B63838/po no.	name MUIRKIRK		
	Miners' Rows at Muirkirk, 1965. Now demolished.		
	©, and permission to reproduce, from: Dr I L Donnachie		

Figure 7.11 Miners rows at Kames, Muirkirk prior to demolition (source: RCAHMS)

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Site 001 - Wellwood Row (NS 654 260)

This site comprised five rows of varying lengths, the smallest being 39.7m and the largest around 99.3m in length. The rows were located on either side of the A70 c 200m east of Nether Wellwood Farm. Inspection of the site revealed a modern electricity sub-station in place of the two southern rows and a mature forestry plantation in place of the three rows to the north of the road. There were no indications of the Wellwood site or the associated garden plots depicted on the second series edition (OS 1897). Consequently the site does not appear in the evidence submitted on Ayrshire miners rows to the *Royal Commission on Housing (Scotland)* in 1913 (McKerrell and Brown 1979).

Site 002 - Powharnal Row (NS 663 250)

The site comprises one long row of around 94.3m in length with associated gardens to the east. It was located high above the River Ayr (c 235m OD) on the edge of the steeply sided March Burn (see fig 7.5 above). Inspection of the site revealed that, although demolished, the footings had survived quite well and in the case of the southern gables stood to c 0.5-0.7 m high. Demolition has rendered interpretation of the structural components difficult, though compartments would appear to be around 9 m long by 3 m wide with central entrances facing both east (into the garden plots) and west (onto an associated trackway): it was unclear whether division of the compartments had been in operation during their use, though the RCAHMS imply that this was the case (1991, 13). Building materials for walling were noted as faced sandstone blocks. A series of small outbuildings were also noted to the northern (downslope) end of the row, which were not apparent on the 1856 Ordnance Survey

plan. The site was probably built around 1790 and had been abandoned prior to the second edition of the Ordnanace Survey map being produced (1897).

Site 003 - Coltburn (NS 692 258)

This site was depicted as ruinous on the 1856 Ordnance Survey plan consisting of two parallel rows of houses on an east to west alignment; the northern row was depicted as 49.6 m in length and containing 8 compartments, whilst the southern row was 50.1 m in length and contained 9 compartments. The site is located to the south of the deserted farm of Springhill and in close proximity to The British Tar Company's works. Site assessment revealed that the site was more complicated than the first edition series indicates. The rows are indeed positioned either side of a trackway, however only the southern row is continuous and appears to be made up of around six houses, each of 2 compartments of approximately 4 m in length by 3.5 m wide. This on reflection would appear to be an alteration to the original plan as each compartment has a separate entrance. The rows on the northern side of the track are not continuous, but made up of small units of 1, 2, 3 and 4 compartments, though internal dimensions are standardised here at 5 m long by 5 m broad. The difference between the northern and southern rows implies a phased construction to the site, the RCAHMS imply that both rows were "constructed in the early 1790s to house some of the miners working in the Wellwood coal pits" (RCAHMS 1991, 3). Construction materials would appear to be ashlar blocks and fireplaces were noted in the western gables. A series of sub-circular structures were also noted to the east of the southern row, though it is unclear what they represent.

Site 004 - Garpel Water (NS 686 255)

This single row of dwellings to the south west of the Garpel Water is unnamed in the Ordnance Survey map of 1856. It was located on a terrace facing northwards at around 235 m OD and is constituted by two buildings. "The row was probably constructed between 1815-20" (RCAHMS 1991, 22). The first is a row of 3 dwellings 20 m in length with each compartment measuring approximately 6 m by 5 m, with a second ancillary building to the east. The row constructed of brick has been recently demolished, however the ancillary building is still standing. The brick-built ancillary building is sub-divided into two internal compartments with a third compartment surrounded by a low wall and open to the elements. This would seem to imply that it is a small wash-house. There is no reference to this site in the 1913 report, though it was still occupied in 1897 (OS second series) and housed miners working the adjacent Wellwood no 1 pit.

Site 005 - Lade (NS 686 251)

Lying further south along the same track as Garpel Water another small row was encountered in an area of disused coal shafts. The site, not noted by the Ordnance Survey in 1856, appears to consist of a row of 4 compartments in length, each compartment measuring 4 m by 3 m internally. It is aligned east to west with probable entrances along the southern wall and is potentially turf-built as no stonework was encountered. An access track was clearly visible to the north of the structure.

Site 006 - Blaweary (NS 685 250)

The small settlement of Blaweary was positioned around 100 south west of Lade within the coal extraction field in 1856. It was constituted by a single structure of around 10 m in length and a small associated garden plot. When the area was visited in December 1995 no trace of the structure was located and it is not noted in the 1913 report.

Site 007 - Linkyburn Square (NS 696 264)

Lying between the old railway station at Muirkirk and the football ground is a small group of dwellings which are collectively termed here as Linkyburn Square, however in the past they were known by different names (Linkyburn, Linkyburn Square, Midhouse Row, Railway Terrace and Kames Row). The 1913 report (McKerral and Brown) indicates that there were 237 dwellings in this area housing a population of 1064 excluding "officials houses' and Linkyburn which is tenanted by Spaniards" (1979 62). In 1856 only the rows denoted as Linkyburn and Linkyburn Square existed or were noted by the Ordnance Survey, therefore the assessment was restricted to these areas. Although the site was still occupied in 1897 further rows had been added to the south and west of the square. Linkyburn was the row nearest to the station and consisted of an L-shaped row 54.6 m north west to south east and 29.8 m south west to north east. Inspection of the site revealed no traces during the assessment, though the 1913 report indicates that they were stone-built single compartment houses with dimensions of 4 m by 3.5 m internally. By 1913 the row was occupied as seven two-room houses. Linkyburn Square in 1856 was constructed as an open-ended square of five rows around a courtyard with gardens in the middle. The smallest rows (c. 30 m

in length) were located along the back of the square and the largest row (c. 55 m long) ran along the north eastern edge. Linkyburn Square was constructed to house furnace workers. Analysis of the site indicates that the square itself had been added to probably in the late nineteenth century by the construction of new ironworkers' cottages and a church (see fig 7.13). Whether this led to the abandonment of the original houses around the square is unclear, though at the very least parts of the north eastern row would have to have been removed to accommodate the new cottages. The rows to the back of the square have survived as footings and in general reflect the Ordnance Survey plan, though in the case of the eastern row depicted as a continuous row in 1856, it is clearly two separate rows with a 1.5 m break between. The four rows at the back indicate continuity of construction, each having three compartments, with the exception of one row which has four compartments. All of the compartments have entrances onto the square and each is 6 m by 4m internally, built of ashlar blocks with occasional bricks present and roughcast on the exterior. Concrete floors were also apparent. The 1913 report indicates that there were 15 two apartment houses in the Square at that time housing 64 people. Interestingly it is also reported that the houses were built of brick, a feature which is not readily seen in the surviving remains.

Figure 7.12 Ironworkers row, Muirkirk

Dalmellington survives in a fairly intact state and is currently presented as a tourist attraction. Like the ironworks itself the industrial settlement pattern has tended to survive, though it is currently under threat, within the eastern extraction fields around Pennyvenie and Chalmerston North, from opencast mining operations (see MacGregor 1996). The eastern area has already been the subject of assessment and survey in the recent past (see Hothersall 1989, MacGregor 1996a; 1996b). In consequence it was excluded from the field assessment for this chapter in favour of the northern, western and southern extraction fields (see fig 7.14). Seven sites were visited and assessed in this area.

Site 008 - Dunaskin Bridge (Chapel Row) (NS 444 081)

In 1857 a small row of buildings was located to the east of Dunaskin Bridge and to the north of the main road (A713). Located on the periphery of the Waterside ironworks it was unnamed at this period, though was still occupied in 1897 (OS). Investigation of the site revealed that the row which measured 29.7 m in length had been levelled in the late nineteenth century by expansion of the Ayr and Dalmellington Railway. However, a new row had been built in the late nineteenth century and located some 100 m west on the opposite side of the road. This row was named Chapel Row because of its association with the church nearby and extends some 80 m in length. The Chapel Row, constructed of ashlar blocks and roofed with slate was purposely built to have two apartments either side of a central entrance. This is the only surviving row within the village of Waterside.

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Site 009 - Waterside Rows (NS 436 087)

The major group of workers' rows in relation to the ironworks at Waterside were located to the north west of the ironworks itself and straddled the main road (A 713) in the mid-nineteenth century. These rows, which numbered eight in total, varied in size from 64.5 m to 238.3 m in length. All of the sites noted were still occupied in 1987, though appear to have been levelled shortly afterwards and have left no traces. They are not referred to in the 1913 report (McKerral and Brown, 1979).

Site 010 - Colliers Row (NS 430 078)

During the 1857 survey the site of Colliers Row was noted by the Ordnance Survey as occupied. It is positioned on the hillside to the south west of the ironworks in close proximity to Keirs Limeworks and would appear to be related to limestone mining in the area. Inspection of the site revealed reasonably well preserved footings to the east of the main track leading into the limeworks. A single structure of around 11m in length by 4 m in width internally was noted as having three compartments and a surrounding yard wall. The northernmost compartment was 4 m by 4 m in size and the other two were 3 m by 4 m in internal dimensions. The walls were heavily robbed and turfed over which did not permit assessment of construction materials, likewise the entrances were obscured but are likely to have faced onto the track. The site had been abandoned by 1897.

Site 011 - Keirshill (NS 430 076)

The site of Keirshill was noted a further 200 m along the same track and appeared to represent a small building rather than a row in 1857. Positioned high above Keirs Limeworks its function was unclear. Field assessment revealed a fairly large structure (c 8 m by 5 m) of constructed sandstone blocks with lime mortared jointing. A secondary outbuilding was noted appending the main structure to the west where the main building's walls had been preserved to c 1 m high and 0.4 m wide. The outbuilding was open on the southside and measured 2 m long by 4 m wide. Although the site may simply represent a small agricultural settlement, its location at an access point into the quarry may imply its use as a dwelling for a quarry official. The site was roofless by 1897.

Site 012 - Corbie Craigs (NS 456 089)

Corbie Craigs was located high above the valley floor to the north east of the Ironworks sitting on a small terrace between the steeply sided Dunaskin and Burnhead Burns. Built by the Dalmellington Iron Company to house ironstone miners working the adjacent Corbie Craigs pit it was constructed in the early 1850s from bricks produced at the Waterside brickworks. Assessment revealed this to be the best preserved of all the mid-nineteenth century sites visited during the fieldwork period. Constructed in a single row there were ten dwellings noted which varied in size from single apartments to structures of three compartment size: in every case the compartments were 4 m by 5 m in internal dimensions. Construction technique was double-skinned brick walls (c 0.2 m in thickness) with ashlar sills and lintels and concrete roofing would appear to have been utilised as no evidence of slates was

apparent. The row had been developed further by the addition of porches and brick coal stores for each dwelling to the south after primary construction. Likewise the addition of rooms to the rear (north facing) appeared to be a secondary feature, though the first edition Ordnance Survey plan indicates their existence as early as 1857. Two large mounds were also noted at the eastern and western ends of the row, though there exact function is unclear. Interestingly the site is not referred to in the 1913 report, though it was still occupied at that time.

Site 013 - Benwhat (NS 463 098)

The site of Benwhat incorporates elements of the industrial and pre-improvement agricultural landscape. In Chapter One these were defined as Benwhat Farm and Benwhat Village. For the purpose of this section both sites will be discussed in conjunction to allow a degree of comparison. Hothersall has suggested that the village of Benwhat was established around 1850 by the Dalmellington Iron Company (1989, 7), however this is contradicted by a number of authors (e.g. Smith 1967, 52; Farrell 1983, 5). Certainly by 1857, when the Ordnance Survey surveyed the area, only the deserted steading was noted. In all probability Benwhat Village was not constructed until the early 1860s. Confusion over the history of the site is further developed between Farrell and Smith, the former suggesting that initially twenty dwellings were constructed, whereas the latter states that forty were built. Whatever the reality of this early growth the site was certainly well established by the 1897 (OS second series) with five rows of houses apparent. Each row was known by a specific name (Laigh Row, Stone Row, Middle (Store) Row, Post Office Row and Heath Row) and "were constructed of hand-made Dunaskin brick" (Farrell 1983, 5).

Figure 7.13 Benwhat miners rows, Dalmellington

Assessment of the site revealed a large number of dwellings of regular plan, with both single and two apartment structures present (see fig 7.15 above). Smith has suggested that there were eighty-four houses built (1967, 52). In each case a brick-built extension to each house was apparent to the rear, which Farrell suggests acted as a scullery (1983, 9). The compartment sizes vary between the one and two compartment dwellings, the single apartments are 5.7 m by 3.5 m in extent, whereas the twin compartment houses had rooms of 2.6 m square and 4.9 m by 3.2 m. Entrance porches were also apparent in some cases. Although Benwhat Village was still inhabited well beyond 1913, it is not referred to in the McKerral and Brown report (the site was finally abandoned in 1951). In contrast with the village site the deserted agricultural settlement of Benwhat Farm lies above the village in the lee of Benwhat Hill. Cartographic evidence would suggest that a site was located here from at least 1775 (Armstong), though is not referred to by Thomson in1828. Smith suggests that the upland agricultural settlements were cleared some fifty years prior to Dalmellington Iron Company buying the land in 1845. The site was certainly roofless in 1857. Although constructed as a long row of four buildings the variation in compartment size (the largest being 16 m long by 5 m broad and the smallest 3.5 m long by 5 m broad) and entrance position clearly indicates a vernacular township rather than a 'model' house construction. This is further confirmed by the associated landscape features which reveal a complex series of small fields with rig cultivation and clearance cairns together with a small corn-drying kiln (see fig 1.6).

Site 014 - Lethanhill and Knockippen Hill (NS 433 099 and NS 435 102)

Located to the west of Benwhat above the village of Patna were the industrial settlements of Lethanhill and Knockippenhill. Both sites in 1857 were noted as single rows of around 70 m and 84 m in length. Originally constructed to house ironstone miners for the burgeoning north-western field around Lethan Hill and Knockippen Hill (known as the Knockippen Plateau) they expanded considerably as the century went on. Building work by the Dalmellington Iron Company from the early 1850s led to 190 houses being created by the end of the 1860s (Smith 1967, 51) between the two villages, which became more generally known as Lethanhill. Inspection of the site failed to locate either village, though in the case of Knockippenhill the fairly recent plantation of fir trees in its locality is probably obscuring the site. The 1913 report on miners' rows makes reference to both villages and indicates that they were in a poor state of repair with few conveniences by then (McKerral and Brown 1979, 53-57). The adjoining Burnfoothill site is described as containing 256 dwellings, the majority of which were stone-built single apartments, whereas the Lethanhill site is described in some detail as comprising eight rows of around 172 dwellings. In the case of Lethanhill the rows varied between brick-built single apartments with rooms generally around 5.7 m by 3.5 m, and twin apartments with rooms of 2.6 m square and 4.9 m by 3.2 m. In general, construction would appear to be similar to the Benwhat examples. Although the villages were not located a previously unrecorded agricultural settlement was noted in the vicinity (at NS 432 098). This site, sitting on a knoll above the Drumgrange Burn and to the south of Lethanhill Village, was not noted by the Ordnance Survey in 1857 and does not appear on earlier maps. The site consists of a group of three structures, the northern of which has multiple compartments (four in

total) and two enclosures, the compartments vary in size from 3.5 m by 4 m to 11 m by 4 m. The largest building is 12 m by 4.5 m in internal dimensions (see fig 7.16: proforma sheet for this site for further details).

Figure 7.16 Proforma recording sheet for Lethanhill MOLRS

Industrial Settlements - Proforma Sheet

Site	Code	Map No
LETHAM HILL	/	NS40NW

Name	NGR	Industry
DRUMGRANGE BURN	NS432098	AGRICUTURE

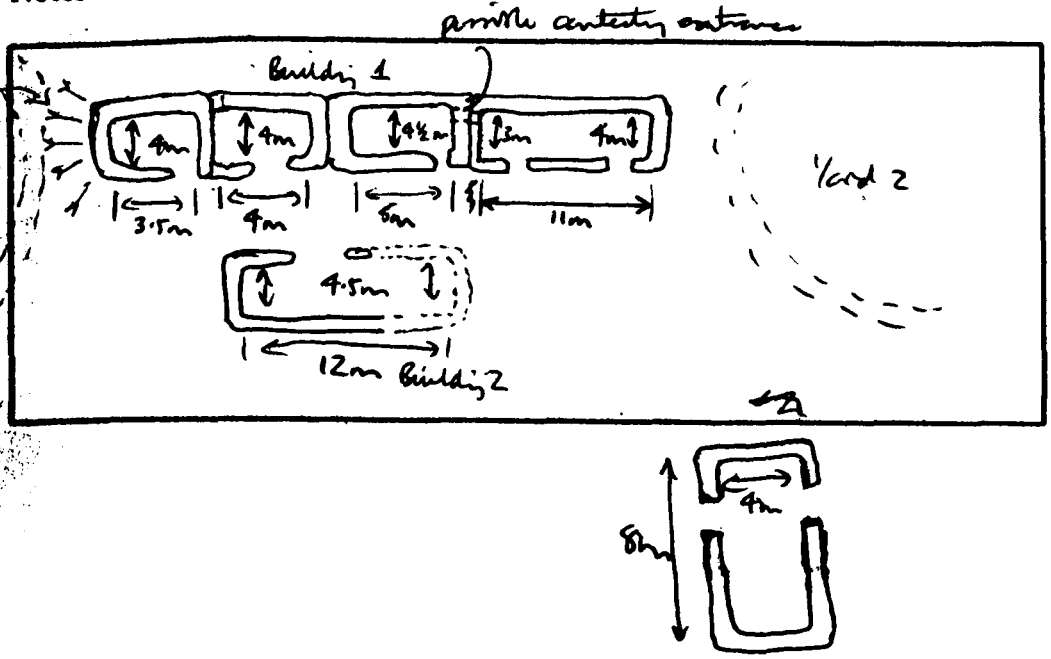
No of Buildings	Alignment	Compartments
3	N-S & E-W	BUILDING 2 & 3 → 1 BUILDING 1 → 4

Dimensions	Hearth	Entrance
see below	/	BUILDING 2 → Probably N BUILDING 3 → E & W BUILDING 1 → S

Description

NO sign of miners row in grid identified. However suggested settlement does exist in close proximity. Appears to have been abandoned some time ago (check OS). Consists of 3 buildings and 2 yards along northern flank of small hillock. NO sign of cultivation ridges in area. Wall thickness varies from 0.5m → 0.7m

Notes



The third area selected for assessment was Lugar Ironworks to the north east of Cumnock (see fig 7.17). The ironworks itself was constructed in 1846 and operated under a number of owners until it was taken over by the Eglinton Iron Company in 1856. This led to the building of a new works which became operational in 1866. Lugar like Muirkirk was a successful venture which lasted until the 1920s. The works themselves were demolished and replaced in the 1970s by Cumnock and Doon Valley District Council offices, however the associated industrial settlement pattern has tended to survive, particularly to the north of the works around Airds Moss. Assessment was therefore concentrated in this area and in the vicinity of the defunct ironworks (see fig 7.18). Nine sites were visited within the assessment area.

Site 015 - Craigstonholm Row (NS 591 211)

The Craigstonholm Row was depicted in 1857 as a long single row of dwellings (c 129 m in length) facing onto the ironworks within the village of Lugar. It is unclear whether it was constructed for ironworkers or miners, though the latter is more probable. Field assessment in the area revealed no upstanding traces of the row, though concrete flooring was discernible under the turf. This row was not referred to in the 1913 miners' housing report, though was occupied in 1897.

Site 016 - Hollowholm Row (NS 593 214)

This site was located to the south east of the ironworks on the northern side of the Cumnock to Muirkirk road. In 1857 two large rows of dwellings (one of c 60 m length and the other of c 114 m length) had been constructed here.

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no. A 7910/po	name Lugar
PRINT ONLY	General view
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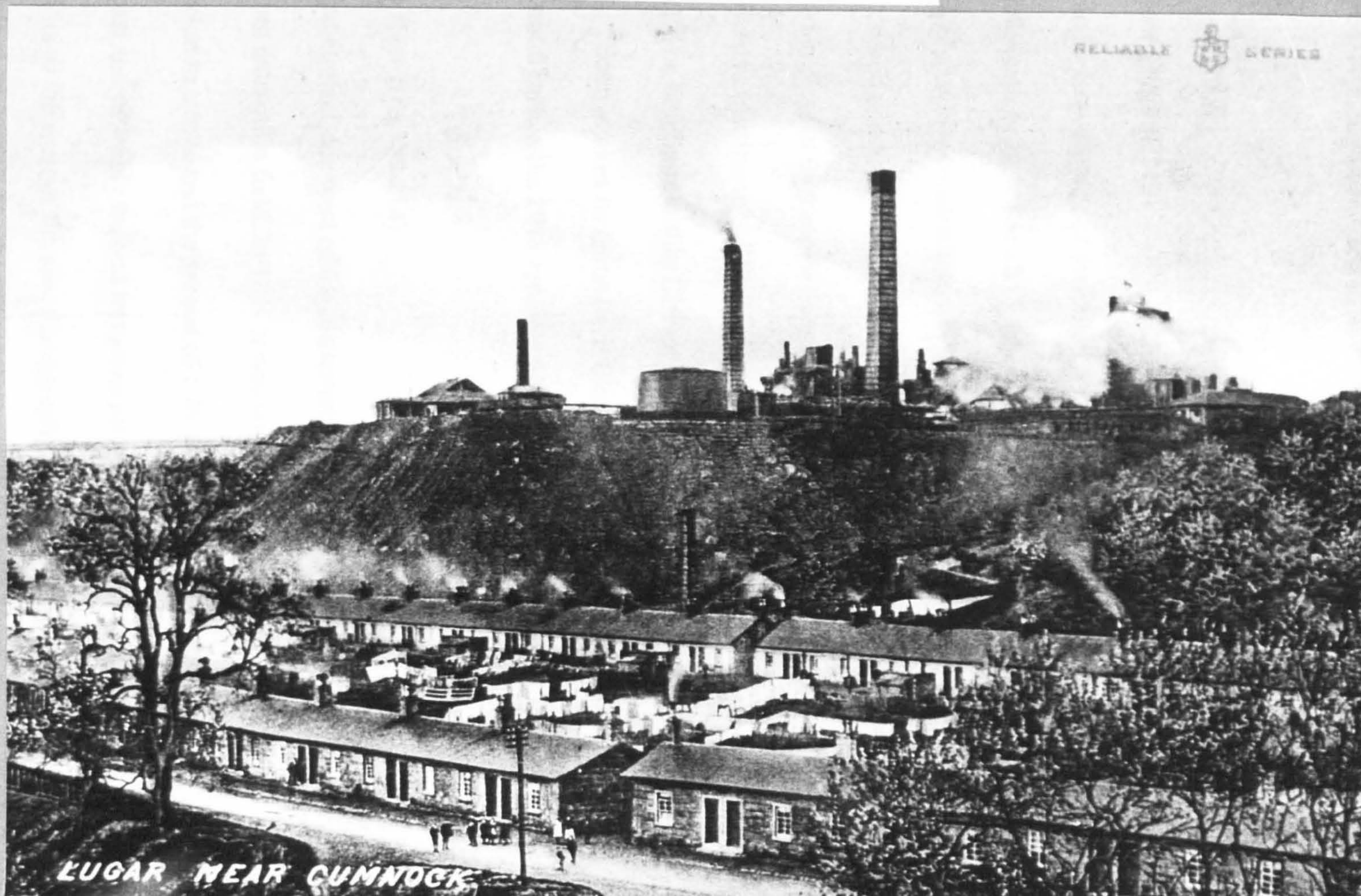
Figure 7.15 Lugar ironworks (source: RCAHMS)



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Inspection of the site revealed that both rows had been demolished and replaced by a modern housing scheme. Likewise the adjacent rows known as Store Row and Back Row have not survived. Although occupied in 1897, none of these sites were referred to in the 1913 report.

Site 017 - Chapel Row (NS 591 213)

The Chapel Row is an L-shaped block of dwellings which lies to the south of the ironworks. The site although occupied in 1857 appears to have been re-modelled between 1857 and 1897 to allow construction of ironworkers' houses in this area. The structures are still occupied and appear to be small two-apartment sandstone-built houses with front garden plots in the case of the six examples facing onto the Cumnock to Muirkirk road (similar to the Muirkirk ironworkers' houses in constructional terms). The buildings within Chapel Row proper face straight onto the lane with no gardens. The row takes its name from the church located at the end of the lane. This row does not figure in the 1913 report either.

Site 018 - Peesweip Row (NS 589 214)

Peesweip Row was positioned due west of the main ironworks site at Lugar and sat on the edge of the western extraction field. In 1857 it was constituted by two rows end to end, one of around 89 m in extent and the second of c 40 m in length. Both rows had garden plots to the east and probably housed ironstone miners working in the Dickston Ironstone Pits to the west of the site. Cartographic assessment of the modern (1986) Ordnance Survey map of the area indicated a row of 40 m in length at the same location and on the same alignment, however field inspection revealed this structure

to be of late nineteenth century in date, representing workshops associated with the ironworks. Once again the site was not referred to in the 1913 report.

Site 019 - Common Row (NS 577 230)

Located approximately 2 km to the north west of Lugar ironworks at the southern end of the Common Loch and adjacent to the Barglachan Coal Pit and Maid Ironstone and Coal Pits was the site known as Common Row. In 1857 the site comprised a single row of 65 m in length. The site has been mined as an opencast operation since then and is currently inaccessible. It is therefore unclear whether the row has survived or been swept away. This site was visited in 1913 at which time it consisted of 96 stone-built two-apartment houses in one continuous row: "the population of the row was 506" (McKerral and Brown 1979, 11). However the Common Row referred to was the late nineteenth century row situated to the north of the 1857 site.

Site 020 - Dyke Row (NS 574 222)

The Dyke Row forms part of a larger group of rows known here as the Birnieknowe Rows and located to the south of Barglachan Coal Pit. This small row was in existence in 1857 (OS first series) and was constituted by five dwellings on an east to west alignment. The row was around 29 m in length with each compartment being c 4 m square: entrances are likely to have faced to the north, though the remains are not clear on this point. The wall thickness was around 0.25 m for interior walls and around 0.5 m for external walls, which may imply that cell divisions were brick-built as opposed to the stone-built external walls, however turfing has obscured this. Two

small dykes were noted to the east and west of the row. This site does not feature in the 1913 housing conditions report.

Site 021 - Long Row (NS 576 222)

Characteristically the Long Row, which also forms part of the Birnieknowe group, is indeed a continuous row of buildings. Surveyed by the Ordnance Survey in 1857 the site is located to the east of Dyke Row extending up to the now dismantled Glasgow and South Western Railway line. At the time of surveying the site comprised a row of around 119 m in length, though later alteration and addition occurred. Inspection revealed original structures to be sandstone-built and around 4 m square in size with entrances to the south west and wall thickness of around 0.5 m. To the east of the row a number of brick-built dwellings have been created, however it was unclear whether they were later additions or not. This site does not feature in the 1913 report.

Site 022 - Commondyke Row (NS 575 223)

The site called Commondyke Row by the Ordnance Survey in 1857 was located to the north of the Dyke and Long Rows and forms part of the Birnieknowe group. Slightly smaller than the Dyke Row this row appears to have been constructed as two twin-apartment dwellings on a north to south alignment with entrances to the west. Each compartment was around 4 m square with 0.5 m wall thickness and built of sandstone blocks. Garden plots were also noted to the north of this site. Once again this row is not referred to in the 1913 housing report, though it had apparantly changed function by 1897 and was noted as a Roman Catholic chapel at this date.

Site 023 - High Row (NS 577 221)

The final site within the Birnieknowe group was known as the High Row in 1857. This row was c 109 m in length and positioned to the south east of the Long Row. Field evaluation in this locality was unable to locate the site and it is postulated that a re-alignment of the main road and the creation of an access track between the main road and Dykes Farm have eradicated the remains of the site. However, on the opposite side of the main road at the same grid reference another row was noted, which would appear to be later in date. This site was not referred to in the 1913 report.

7.6 Discussion of the Assessment Results

Although much work has been undertaken by historians in relation to ironworks in Scotland this has tended to focus on the development of technology (i.e. the transition between cold-blast and hot-blast furnaces), their economic influence and the entrepreneurs behind them. Little interest has actually been shown in the social organisation and the effect of industrialisation on community life in concentrated research studies. There are some notable exceptions to this (e.g. Campbell 1979), but in general, when social history is written the workers tend to be remaindered to a chapter or sub-chapter in most works. Although local histories are clearly more abundant on this topic interest tends to be focused on the latter end of developments (i.e. from the late nineteenth to early twentieth century). This in turn means that the earlier social developments for sites tend to be sketchy to say the least. The classic example here is the somewhat confused histories in print over the mining settlement of Benwhat (see above for discussion).

The focus for this piece of work has intentionally drawn upon the remains of those sites to hopefully allow a better understanding of the archaeology of industrialisation. In many ways this is equally problematic as most industrial archaeologists have tended to concentrate on the remains of industry and technology to the detriment of settlement pattern. The classic example is the Scottish Industrial Archaeology Survey which is undoubtedly a useful, and under-used, resource, but characteristically does not deal with settlement sites (see SIAS catalogue and chapter 3). This assessment was therefore undertaken with a series of aims in mind:

1. To assess whether industrial settlements have survived in relation to the iron industry in Ayrshire by focusing on three ironworks of the mid-1850s.

2. To view the settlement forms of different industrial workers (iron workers, coal miners, ironstone miners and limestone miners) to assess whether differences in provision of housing can be discerned.

3. To discern if the building of model housing for workers led to different forms of accommodation dependant upon the company constructing them.

Each of these aims is presented below as individual themes to allow for some clarity in the discussion. In terms of the survival of the settlement pattern itself, it is clear that the sites which tend to survive are located within the eastern coal and ironstone extraction fields. Those ironworks and their associated industrial housing in northern

Ayrshire have not survived to anything like the same degree. Sites like Glengarnock, Blair or Ardeer located on the periphery of urban centres have essentially been removed after closure and in some cases such as Portland (Hurlford) and Eglinton (Kilwinning) the sites are now covered by housing schemes and industrial estates (cf. Campbell 1966, 95), with only place-names to indicate their existence (i.e. Furnace Row in Hurlford). At the three sites chosen for this assessment village expansion has been limited since the 1850s, it was therefore felt that survival of industrial settlements may have occurred. This assumption proved to be false, and although late nineteenth century examples of ironworkers' houses were located at all three sites (Linkyburn Square, Muirkirk; Chapel Row, Dalmellington and Chapel Row, Lugar) development had eradicated the earlier rows within the villages. The assessment also dealt with sites on the periphery of the villages, associated with the communications arteries and in the upland extraction fields. Here survival has tended to be better; of the sixteen sites visited across the three areas ten were noted as surviving in some form. Admittedly the general picture is survival of footings only, though Corbie Craigs, Dalmellington does stand to wall height along its southern face.

With regard to the second aim of the assessment it is clear that although differences were apparent between the accommodation provided for ironworkers in comparison to the rows and squares constructed for colliers, there was no discernible difference between forms of collier. The houses and associated infrastructures provided for ironstone miners were equally as poor as those provided for the coal and limestone miners. This is probably related to skill factor on one level and to the mobility of coal

miners on the other. Hume has suggested that this contrast was reflected in the quality of housing built for the two groups:

> "In the first ironworks of any size, Muirkirk, the owners provided thatched cottages for colliers and slated houses for ironworkers, most of whom were skilled men from England" (Hume 1988, 11).

The application of essentially vernacular building traditions such as thatching was not solely a product of late eighteenth century attempts to house workers however, as late as 1913 the evidence on miners rows submitted to the *Royal Commission on Housing (Scotland)* related that a site known as Old Pottery in the parish of Ochiltree still utilised this traditional roofing material: "most of the houses are built of stone, and have thatched roofs" (McKerral and Brown 1979, 5). In general terms, the quality of housing provided for colliers of whatever description was poor, a feature which contemporary sources were quick to point out (e.g. see Anon 1863, 51; Bremner 1869, 26-30).

The form of dwelling provided, particularly in the case of colliers housing, was a product of a number of inter-related factors. Hume has implied that "the characteristic house type was the single-storey one and two roomed cottage, commonly linked in rows" (1988, 11); of this there is little doubt. The sites examined as part of this chapter tend to imply that the layout of these structures was fairly uniform with single apartment rows showing a fairly regular interior size of around 16 square metres of living space. The only site to vary considerably from this was Powharnal Row at

Muirkirk which appeared to have approximately 27 square metres of living space, though demolition rubble may have obscured dividing walls within the interior of individual dwellings. The differences which were apparent between the dwellings in terms of construction materials and ground plans are the result of different companies building the rows, rather than differences in ideological approaches to their construction. In Dalmellington for example the Dalmellington Iron Company utilised Dunaskin bricks to build the majority of the houses. This is reflected across three of the sites in floor dimensions; at Corbie Craigs, Benwhat and Lethanhill ground plans in single apartment dwellings were all around 20 square metres in size. This is also reflected at Lugar as well, though Muirkirk tends to have a greater variety of materials and ground plans present; however this is probably due to the chronology of construction rather than a more vernacular approach to building. Dalmellington and Lugar were both created around the mid-1840s and for much of their productive lives remained in the charge of particular companies (the Houldsworths at Dalmellington and the Bairds at Lugar), whereas Muirkirk was at least fifty years older and had been through several owners prior to the Eglinton Iron Company 'take over' of the works in 1856. In consequence it is little surprise that variations in model housing occurred here, as "the detailed design of such cottages varied from employer to employer" (Hume 1988, 11).

7.7 Iron masters in the ascendancy: the 'political' landscape in Ayrshire

Prior to concluding this chapter it is necessary to reflect on how applicable the model of political and vernacular landscapes developed within this thesis really is in relation

to industrialisation. In Chapter One discussion of the transformation of the landscape viewed through the theoretical model of political and vernacular landscapes (Jackson 1985) was discussed in some detail. Political landscapes, it has been suggested, are controlled and created by elites, they ignore topography and adopt locations to gain maximum economic advantage, whilst utilising products of mass production to define their form. In Chapter One it was also noted that although the model works well in contrasting designed landscapes of the elites with pre-improvement agricultural townships in eighteenth century Scotland, when transitional landscapes are assessed difficulties occur. The complexity of landscape, particularly in periods of structural change, introduces anomalous partnerships between the vernacular and political elements. This is particularly evident in the settlement pattern, as the case of Benwhat landscape, Dalmellington in the 1850-60s confirms. The three ironworks at Dalmellington, Lugar and Muirkirk and their associated settlements discussed above allow Jackson's definition to be refined further. The political nature of ironworking is clear enough, the landscapes of extraction and production created and controlled by elites, in this case iron-masters and landowners, altered both the settlement pattern and the face of the countryside. The creation of large ironworking and mining communities in marginal upland landscapes such as Muirkirk or Dalmellington led to rapid expansions of population, which in turn required rapid housing programmes to accommodate them. In Muirkirk for instance, the minister writing for the *Statistical Account* suggested that 532 new people had been attracted to the new manufactures in the Muirkirk area by 1792 (OSA 1792, 480), though the fluctuations within the population were clearly substantial:

> "In a crowd of people, that are perpetually shifting, some going and some coming in their room, it is difficult to mark the precise number for even a few weeks; and were the numbers now fixed, they would not probably remain the same till the account of them is published" (OSA 1792, 480).

Given that the production did not begin on a significant scale until 1793 the scale of fluctuation must have been spectacular. This was a feature wherever new ironworks were located, in Dalmellington for example in order to house the increasing population "for a period after 1851 large huts were set up at Waterside accommodating men and sometimes their families as well" (Smith 1967, 48). The use of temporary accommodation was undoubtedly a feature elsewhere within the rural ironworking sector, prior to the construction of company houses. The use of the company house was a spectacular piece of social engineering which allowed coal- and iron-masters the ability to attract workers to the region and retain them by provision of accommodation. That provision also had a secondary effect, it placed the power of control in work relations firmly in the hands of the owners, because the houses were tied to employees, the loss of employment also meant loss of accommodation. As Campbell (1979) has made clear this had the effect of restricting unionisation of the workforce and in essence allowed poor housing conditions to remain a feature of the mining industry well into the twentieth century.

There is little doubt of the political nature of the location of settlements, particularly mining settlements, "their exact location was determined by the need to have it convenient to the mine" (Campbell 1966, 100). Topography was ignored in favour of

maximum economic advantage, which in the early years meant that provision of schools, places of worship and in some cases even stores was not considered in the selection of, and construction of, sites. This was clearly evident at sites such as Powharnal Row, Muirkirk, or Common Row, Lugar (this row became the largest continuous row in the county with 96 houses). As Campbell suggested in 1966 it "is obvious from a cursory glance at those which remain, rarely was any attention paid to the nature of the soil or subsoil, amenities or exposure" (1966, 100).

Finally, the only area where industrial settlements in association with ironworks did not always conform with the criteria expressed above was in the use of the products of mass production to define their form. As has been indicated above, the use of thatching and quarried stone was used in some cases, however this was done directly as a means of economy. The plan of the structures in contrast shows no real variation, the series of forms adopted owed more to 'model' housing construction on the large scale than to vernacular forms. "The row was all pervasive in Ayrshire in the middle of the nineteenth century" (Campbell 1966, 100), but it was not the only form. Some companies, for example the Ardeer Iron Company preferred to build in squares, though internal layout of dwellings differed little. The settlement pattern created by the iron and coal industries in Scotland during the late eighteenth and nineteenth centuries was peculiar in some ways. The politicisation of their settlement pattern was total, a feature which was not repeated in other expanding industries to such a degree during the late eighteenth and early nineteenth centuries. The large-scale expansions in weaving for markets in Glasgow during the 1780s in particular did not lead to such radical forms, instead "the models used were largely vernacular" (Hume 1988, 12) in

character. However the contrast between them can be seen in choice of locality, weaving was essentially a village centred industry, iron and coal on the other hand was a rural development. In essence:

> "The place of the more isolated rural communities of the past was taken by the miners' row, the most interesting and characteristic addition of the period, few of which were built in existing towns, and so failed to gain the advantages of such limited social provision as was to be found in them" (Campbell 1966, 99).

By corollary, the politicisation of rural industrial settlements was not just a social change but a cultural change as well.

7.8 Concluding comments

The changes brought on by industrialisation within the rural countryside had profound and extensive implications for the development of the settlement pattern in Ayrshire well beyond the lifetime of the furnaces that initiated them. This has led Strawhorn to conclude that "one of the most sensational advances of the twentieth century has been the improvement of housing" (1979, 3), a fact which owes more to the history of poor quality industrial house building from the late eighteenth century onwards, than to council building schemes. The major impact of the iron industry in Ayrshire was not the advancement of technology or economic success, as many economic historians and industrial archaeologists have presented it, but the social consequences of creating

ill-prepared communities on the fringe of society. The relationship of iron and coal entrepreneurs was fundamental in the creation of physically segregated and desolate communities at exposed locations throughout the county; in fact wherever minerals could be extracted economically these settlements were 'flung down'. The term 'economic exploitation' in nineteenth century Ayrshire was not only about exploiting natural resources, but was also equally about exploiting human resources. This chapter has attempted to place that exploitation within the context of change from the 1780s onwards and the development of a particular form of settlement to house the workers. Field assessment has confirmed the political nature of those industrial settlements which were envisaged, created and allowed to decay, by the iron-masters and coal-masters of the county. In many ways the process of transformation between the vernacular landscapes of the early modern period and the political landscapes of the nineteenth century is most sharply felt via the remains of deserted mining communities. The archaeological remains of "degradation and squalor of so many rows reflects the position which the miners then occupied in the Scottish social system" (Campbell 1966, 100). Archaeological landscapes consisting of single-ends and butt-and-bens with no privies and no running water stand in stark contrast to perceived histories of the age of enlightenment and philanthropy. In reality, if the social changes to the agricultural landscape are to be viewed as Improvements, then the social developments of the Industrial Revolution must be seen as a form of antithesis.

Chapter 8

Ayrshire 1600-1870, overview and conclusions

8.1 Introduction

The introduction to this work began with a quote from T C Smout which related how the social transformations of the Industrial Revolution period were equally as strong as those witnessed during the Reformation. In reality this does not go far enough, the social impact of agrarian and industrial expansion witnessed particularly after 1750 was much more profound in its impact. In the space of two generations the cultural and social landscapes of Scotland were altered beyond all recognition; a change which was deep-seated and affected the entire countryside. In order to understand those changes and their global impact the final goal of this piece of work to give an overview of industrialisation. This is presented below in a short section dealing specifically with the scale of industrialisation. It is then the intention to summarise the aims of the thesis prior to developing a final conclusion to this piece of work.

8.2 Ayrshire: an overview of industrialisation

The very scale of industrialisation between 1750 and 1850 was staggering. Although some authors have suggested that "the industrial legacy from the later eighteenth century is most prominent in the Scottish landscape" (Whyte and Whyte 1991, 208), it must be understood that the expansion in heavy industries in particular from 1840 has left an equally indelible resource. A review of the Ordnance Survey first edition series (1855-57) indicates over 2360 locations where exploitation of natural resources and industrial production had been, or was currently being undertaken. This should be seen as an under-estimate of the real figure for a number of reasons. Firstly, the figure

merely indicates areas where industry was located it does not take into consideration multiple groups of sites, for example for the purpose of the figure noted above collieries such as Mansfield in New Cumnock parish which contained five coal pits, five old coal pits, one coal level and one old coal level were noted as one site. Secondly, the Ordnance Survey data although probably accurate in rural areas undoubtedly only gave a rough sketch of the scale of industrial endeavour in urban areas. Taking these points into consideration the real figure was probably in excess of 5000 places of work. This of course does not mean operational sites as the data reflects both in a out of use places of work (see chapter 1 and 6 for further discussion). If we take Whinstone Quarries as an example it is clear that the majority of sites noted by the Ordnance Survey were in fact abandoned locations: 267 active whinstone quarries, as opposed to 343 old whinstone quarries. It is also worthwhile noting that, particularly in the case of stone extraction sites, many of these were not operational all year round (cf. Whyte & Whyte 1991, 208). Having quantified the figures somewhat, it is also abundantly clear that the level of exploitation was still fundamentally high, though not evenly distributed throughout the county. Figure 8.1 below indicates that the scale of industrial expansion in some parishes was spectacular, whilst in others it was negligible.

Parish	*Number of Sites*
Ballantrae	89
Colmonell	132
Barr	22
Girvan	91
Kirkoswald	57
Straiton	48
Dailly	55
Dalmellington	61
Kirkmichael	50
New Cumnock	97
Ochiltree	12
Maybole	74
Auchinleck	65
Old Cumnock	57
Coylton	24
Dalrymple	20
Craigie	5
Ayr	18
Mauchline	30
Sorn	67
St Quivox	17
Tarbolton	26
Stair	21
Monkton & Prestwick	14
Muirkirk	75
Newton	1
Galston	71
Kilmarnock	47
Riccarton	64
Symington	27
Kilmaurs	32
Dundonald	46
Loudoun	54
Fenwick	49
Kilwinning	142
Irvine	26
Dreghorn	27
Stewarton	97
Ardrossan	88
Dunlop	63
Dalry	213
Beith	101
West Kilbride	52
Stevenston	2
Kilbirnie	74
Largs	48

The spectacular nature of industrialisation in the northern parishes, particularly in Dalry, Kilwinning and Beith stands in start contrast to the central parishes in the county, for example Craigie, St Quivox or Ochiltree, where agricultural development was clearly more fundamental. There are some unusual results as well which are not readily interpreted, for example the northern parish of Stevenston only registered two sites, a coal pit and a freestone quarry, both of which were out of use. When it is considered that this parish was probably the earliest centre of coal mining in Ayrshire, for example coal hewers such as John Smith were transacting in land by 1650 (*Register of Sasines for Ayrshire*), it is therefore all the more surprising that industry would appear to have so little impact here in the mid-1850s. The southern portion of the county (Carrick) also proved surprising with particularly high figures for three of the parishes: Girvan, Ballantrae and Colmonell. A closer inspection of the data here revealed that this was a false impression given by inordinately high numbers of quarry sites. In Colmonell parish for instance, 107 of the 132 sites noted were in fact quarries (63 gravel pits, 40 whinstone pits, 3 old whinstone quarries, 1 freestone quarry and one sand pit). The rest being made up in general by agricultural service industries such as corn mills, saw mills, fulling and wauk mills, and blacksmith's workshops, the only exceptions being Carrick Mill and sites like Aldons limeworks. When one of the northern parishes is taken in contrast, there is a clear divide in industrial specialism with the heavier industries predominating. For example in Dalry parish of the 213 sites noted 35.5% of them were either coal or ironstone mining sites. Although quarrying still played a significant role here with 31% of noted sites. The contrast between the industrialised northern parishes and the rural southern parishes is best seen however in the variety of industries being pursued in these areas at this time.

Figure 8.2 below has been presented to convey the variety of sites in operation in the mid-1850s:

Industry	*Colmonell*	*Dalry*
Clay Pit	0	1
Coal Mining	0	16
Fishery	1	0
Foundry	0	2
Freestone Quarry	1	3
Gasworks	0	1
Gravel Pits	63	0
Ironworks	0	1
Ironstone Pits	0	27
Limeworkings	2	37
Mills	9	7
Print Works	0	1
Sand Pit	1	1
Sandstone Quarry	0	17
Saw Pit	1	0
Smithy	5	2
Threshing Machine	1	0
Tile Works	0	2
Whinstone Quarry	40	9
Total	132	213

The Ordnance Survey data reflects a fairly small variety of industries being pursued on any scale within the county during this period, although it is clear that in some parishes attempts were made to exploit other resources. For example in New Cumnock parish limited lead mining and antimony mining were pursued and in Kirkoswald an acid works was functioning. In general terms the inter-relationship between extractive industries and agricultural support industries is evident within the dataset. The classic case being tileworks with 65% of parishes indicating at least one works in existence. Interestingly comparison with Northern Lanarkshire indicates a much higher incidence of tileworks there, which may indicate that the Ayrshire industry was not based on estate production, whereas the North Lanarkshire industry was (cf. Douglas & Oglethorpe 1993). Fundamentally the scale of industrialisation and its impact on landscape, culture and social life was extensive and by 1860 had still not run its full course.

8.3 Ayrshire 1600-1870: a summation of results

The dramatic changes which occurred in community living during the age of transformation in Scotland have in general received little serious attention in archaeological circles to date. This thesis has attempted to redress this imbalance by concentrating on a series of themes which permit the central issues within both the Industrial and Agricultural Revolutions in Scotland to be developed. Like many other areas within archaeology, this work has concentrated on a period of change in economy and society and how that change has been reflected in the remains of cultural life, in particular the settlement pattern. However, unlike traditional

archaeological transitional periods, interest here has been focused in a relatively short timespan, in reality only 270 years. The ability to do this form of study is undoubtedly a product of the numerous sources (both cartographic and documentary) which are available for the period and the reasonable preservation of both pre-improvement and early industrial landscapes. However as this thesis has indicated, although the landscapes and sites in question date from a late period they are seriously under threat. The threat to later historic sites is particularly acute in relation to industrial landscapes, for although resource managers have of late concentrated effort into understanding and preserving pre-improvement MOLRS sites, there has been little attempt to deal with the archaeology of industrialisation. The recent statement of intent with regard to policy produced by Historic Scotland (Barclay 1997) offers little hope of a sea-change in the near future: Industrial Archaeology is summarised briefly, whereas prehistory takes up the majority of the volume. The 1950s may well have seen industrial sites and landscapes dominate in town and country, however since then the pace of development and change has severely eaten into that resource. As the Whyte's have suggested "the legacy of early industrial activity in Scotland's landscape has been neglected and there is much scope for fieldwork" (1991, 208). This is clearly not the time to be complacent.

The central role of this thesis has been to view the period in question from a series of independent positions, in order to develop a holistic approach to dealing with the archaeology of the recent past. In reality this could only be achieved by utilising work from other disciplines which have not been as reticent about dealing with the period post-1600 as archaeologists have been until recently. The work of economic and

social historians as well as historical geographers have in some ways paved the route for archaeologists to pursue multi-disciplinary and integrated studies of the recent past.

This thesis was begun with the notion that landscapes of transformation, particularly early industrial landscapes are complex palimpsests which require to be dealt with within a strict theoretical and methodological framework. The use of J B Jackson's model of political and venacular landscapes was developed as a potential way of dealing with historic landscapes. Jackson suggestion that:

> "no landscape, vernacular or otherwise, can be comprehended unless we perceive it as an organisation of space; unless we ask ourselves who owns or uses the spaces, how they were created and how they change" (Jackson 1985, 150)

is an important statement which summarises the realities of complex historic landscapes. In order to deal with the changing landscapes of Ayrshire his model was utilised and applied so that the theoretical framework could be used across the subject area. Quite clearly the success of this model for dealing with the complexities of landscape in the period 1600-1870 is limited, particularly when dealing with landscapes in flux (see chapter one). The further development of this in chapter seven has led to the inevitable conclusion that there will always be anomalies within any strict definition which seeks to view forms of landscape as different based on human experience. In reality the differences in community living and the use of spaces

between pre-improvement and industrial landscapes were fundamentally at odds with each other, a fact which is clearly reflected in the settlement archaeology. However, to quantify those differences within the binary opposition of political and vernacular landscapes does not permit an understanding of how human agency affects ordinary peoples lives. In reality Jackson's structuralist approach removes the individual from the organising of space and the role of community.

The establishment of a theory and methodology for understanding landscape change is of course not the only way of dealing with the past. As a contrast to this, chapter two sought to understand the changes witnessed during the period by understanding the economic and social history of the late Medieval period onwards, with particular focus on the early modern development of Ayrshire's crafts. The development of trade structures has received little attention by archaeologists (cf. Atkinson 1994, 523). It was postulated that to understand the force of industrialisation it is essential to understand the development of craft industries within post-Medieval towns, particularly in burghs of Barony which in many cases were established to permit a growth in this sector. This of course was not purely a feature of Ayrshire's development, the inter-relationship between trades and the expanding merchant class from the late Medieval period onwards was a distinct feature of Capitalist growth throughout Europe (cf. Thirsk 1966). The high levels of land transactions witnessed for tradesmen in the seventeenth century suggest an economy which was successful and expanding, whilst the remarkably low levels witnessed for the period 1700-1710 may well indicate a change in social position around this period. Although this was not explored it does offer an interesting sideline for research in the area.

Ultimately the growing sophistication within crafts paid dividends to the expanding economy of Ayrshire in the period post-1750. However the technical and structural changes within the agricultural sector of the county between 1700 and 1760 permitted the development and expansion of the industiral sector in the county to be sustained. The changes which ensued from the improvements movement in Ayrshire provided not only the agricultural surplus which was required to feed a developing industrial workforce, but also provided a fluidity in worker demographics. The releasing of large numbers of craftsmen and labourers from agricultural regimes throughout the county, provided a ready made workforce for industrialisation to utilise. Characteristically, the first phase of industrialisation in Ayrshire followed on from the major agricultural changes in the county. The rise of textile mills, particularly the role of the expanding cotton industry in central and northern Ayrshire was pivotal in this change. The impact of this development was enormous and is reflected in the demographic trends of the period, though a direct correlation between population shift and the establishment of textile weaving and milling centres is not inferable. However a clear feature of the expansion in textiles was the establishment and growth of new villages specifically founded as industrial centres (e.g. Catrine in 1781). The forces of urbanisation, agricultural improvement and transport developments after 1825 had a huge effect on the county's settlement pattern.

By 1860 the rise of heavy industry in the west of Scotland, in particular the iron industry permitted the changes in social structure of the county to continue. A major feature within this was the continued growth of centres such as Kilmarnock, Ayr and

Irvine as major diversified industrial towns. Their role in developing sustained markets and their impact on the economic structure of the county after 1815 is fundamantally clear.

Understanding the historic framework of the Ayrshire is critical, though it is also importnat to view how archaeology has developed in studies of the recent past and not simply to present an archaeological history for the county in the period post-1600. To do this effectively the two main areas of interest (i.e. Industrial Archaeology and MOLRS studies) have been discussed in detail in chapters three and four. Both disciplines operate as essentially separate entities, which in reality is untenable. How can we expect answers from the recent past when Industrial archaeologists are studying industrial remains and technological advances whilst generally ignoring settlement studies in the same period. On the other hand practitioners in MOLRS studies are attempting to understand agricultural settlement patterns whilst ignoring industrial housing (*contra.* Hingley forthcoming). In the past it has been suggested that MOLRS studies should incorporate both forms of community (see Atkinson 1995, 7-8), however to date this has remained a peripheral issue. It is argued here that to understand the past in any period it is essential to take a holistic view, which must incorporate all aspects of society, not just industry or agriculture, but the whole gamut of human experience. It has been indicated within this work that there are difficulties in pursuing such a view as some practitioners in Industrial Archaeology are still inclined to treat the discipline as a branch of economic history, rather than a study of human experience and reflected in material culture. They produce a commodity which is not archaeology, but a cross-breed of economic history and architectural study. This

does not apply to all industrial archaeologists, and it is hoped that more enlightened approaches to the archaeology of industry will provide a clearer focus in the future. MOLRS studies on the other hand has developed as a multi-disciplinary subject (unlike the case in England), though suffers from lack of chronologies for understanding the archaeological remains (cf. Atkinson 1997). It is therefore postulated that the pigeon holing which has become a feature of both disciplines to a greater or lesser degree needs to be abandoned in favour of a comprehensive discipline which deals with historical archaeology as a general area of study. It is further argued that there is a need to utilise the techniques of traditional archaeology in studies of the recent past to the same degree as elsewhere in the greater discipline. Although survey has its place, real understanding can only be achieved by utilising the plethora of techniques available to the field archaeologist.

The main body of this work has been taken up with understanding the changes within Ayrshire by viewing not only the industries of mass production (see chapter seven), but by attempting to understanding the changes in settlement organisation (see chapters five and seven) and the role of domestic industrial expansion in that transition (see chapter six). The understanding of settlement forms and their transition over the period 1600-1870 is a fundamental pre-requisite for appreciating the full impact of agrarian and industrial change. The contrast between the pre-improvement settlement pattern of upland Carrick and the industrial settlements established to house the workers in remote regions in eastern Ayrshire is vivid enough. However the complexities of the Carrick settlements are in themselves another level of intricate variations on a theme. Jackson in discussing the complexities of vernacular landscapes

has suggested that "it grows according to its own laws, rejecting or accepting neologisms as it sees fit, clinging to obsolescent forms, inventing new ones" (1985, 148). This is equally as relevant in relation to vernacular settlement forms. Statistical assessment of the Carrick sites indicates a wide variety of forms, which although a substantial body of work has been pursued there, remain chronologically indistinct. The identification of a previously unidentified form is an exciting prospect, however this will remain an interesting footnote until proper excavation is pursued in the area. By contrast the regularity in appearance of the industrial settlements in association with the ironworking and mining sites offers a different view of the past: a view which sees sites develop to specific entrepreneurial agendas and remain basically constant throughout the period of use. Having said that the lack of work in relation to these sites give equal cause for concern.

The final role of this work has of course been to view the industrialisation of the landscape, and agricultural change within it, through the medium of the agents of change: the domestic and mass industries. The classic example of an agent of change is of course the lime industry which allowed the technical changes, to support the social changes beginning around 1700 (cf. Devine 1994), to be implemented successfully. Lime of course permitted an increase in yields, whilst simultaneously appealing to the tenantry as a successful measure worthy of adopting. In consequence lime burning in conjunction with enclosure lead the way in permitting the Agricultural Revolution's success. Likewise it also sustained coal production in Ayrshire up to the take-off of mass production in ironworks from the 1840s onward. The archaeology of lime in this country has received little attention, though a growing body of work in

England has indicated an early beginning to the industry. Given the pivotal role of lime burning in the improvement movement it is lamentable that no serious study of agricultural lime has as yet been pursued. It is also equally apparent from the assessment work undertaken within this thesis that agricultural lime production sites are a fast diminishing resource, particularly in northern Ayrshire. Although this may not be reflected throughout the county, or for that matter throughout Scotland, the time has come to deal with these sites or lose their complexity forever. As was noted in chapter seven the iron industry and its associated mineral extraction sites were clearly the primary mass production industry of the county during the nineteenth century. The importance of the remaining sites and their settlement patterns cannot be overstated. Relict landscapes like those at Dalmellington and Muirkirk remain as testaments to a period unparalleled in Scottish history for the intensity of development and change: as such they must be preserved as a symbolic referent of the age of mass production. This thesis has argued that too much emphasis has been placed on mass production industries in the past to the dereliction of smaller scale domestic industries. This of course still holds true, however the response to that is not to abandon research into heavy industries, but to give equal credence to smaller scale crafts and agricultural industries of the past: after all understanding human experience in the past requires a strategy that will deal with its complexity.

8.4 Concluding Comments

In the final analysis this thesis has sought to bring together themes which have in the past been dealt with as separate issues within the discipline of archaeology. It has also

suggested that only by utilising holistic views of the past can we hope to achieve any clarity of understanding. It is clear on reflection that this could have been achieved in other ways, different industries could have been studied or more emphasis placed on post-improvement agricultural regimes. There are after all many roads into the past. I would argue however, that the selection of industries and forms of settlement within this work have permitted a focused forum for discussion of change in the post-Medieval landscape, and as such were the correct themes to adopt. In the introduction to this work the archaeology of this period was described as a Cinderella subject, of this there is little doubt. Although it is also clearly a productive period for research which allows the use of many sources not available to traditional archaeologists. Arguably the study of the post-Medieval period has the potential to be more fulfilling than any other archaeological period in terms of the quantity and quality of information available, however this was not the stimulus behind this work. The transition between Feudal agricultural society and Capitalist industrial society was a remarkable period in history, a period which should be addressed and dealt with by archaeologists. This was the primary reason for pursuing this thesis, to be able to view a complete transition in community life, particularly in relation to historically disenfranchised groups such as cottars and miners was the fundamental prerequisite of this study. Richard Bradley once wrote that "archaeologists are divided between optimists and pessimists" (1984, 5), this however is too simple a division. In writing this thesis I have become both; pessimistic in the short term, for the survival of many of the sites and landscapes visited over the last four and a half years, and optimist in the long term, that clearer strategies for the archaeology of the recent past will be developed.

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Appendices

In the following section seven appendices are contained which relate directly to the above chapters. In each case an appendix has been presented so that additional information on a range of topics discussed in the body of the thesis can be compared with the raw data sets (e.g. see chapters 2, 4, 5, and 6). Because a substantial body of data is utilised in the interpretations within this work, it was felt that the bulk of that primary information should be presented in an accessible form for consultation. Due to the constrictions on space within the thesis this data has therefore been presented in tabular form and sorted by parish where applicable to allow for ease of reference.

Appendix 1: Trades noted in Register of Sasines, 1600-1610			
Place	***Parish***	***Occupation***	***Date***
Dalquhearn	Barr	Carpenter	1607
Galstoun	Galston	Cordiner	1605
Irvine	Irvine	Mason	1607
Irvine	Irvine	Skinner	1603
Irvine	Irvine	Tailor	1602
Irvine	Irvine	Walker	1600
Irvine	Irvine	Weaver	1607
Kilmarnock	Kilmarnock	Skinner	1605
Kilmares	Kilmaurs	Cordiner	1604
Kilmares	Kilmaurs	Cordiner	1604
Jakisthorne	Kilmaurs	Tanner	1608
Kilmaurs	Kilmaurs	Tanner	1608
Kilmaurs	Kilmaurs	Tanner	1608
Kilwinning	Kilwinning	Baker	1608
Kilwinning	Kilwinning	Baxter	1601
Byres	Kilwinning	Blacksmith	1601
Smithistoun	Kilwinning	Blacksmith	1601
Easter Bridgend	Kilwinning	Cordiner	1606
Easter Bridgend	Kilwinning	Cutler	1601
Kilwinning	Kilwinning	Cutler	1602
Kilwinning	Kilwinning	Mason	1601
Kilwinning	Kilwinning	Mason	1603
Kilwinning	Kilwinning	Quarrier	1606
Milnehill	Kilwinning	Quarrier	1606
Kilwinning	Kilwinning	Smith	1606
Kilwinning	Kilwinning	Smith	1606
Byres	Kilwinning	Weaver	1608
Newmilnes	Loudoun	Mason	1604
Newmills	Loudoun	Miller	1600
Foulpoffil	Loudoun	Quarrier	1608
Newmilnes	Loudoun	Tailor	1603
Newmilnes	Loudoun	Tanner	1608
Newmilnes	Loudoun	Tanner	1608
Bargour	Mauchline	Smith	1607
Maybole	Maybole	Cooper	1608
Maybole	Maybole	Currier	1602
Maybole	Maybole	Shoemaker	1605
Maybole	Maybole	Skinner	1606
Kirkland of Maybole	Maybole	Smith	1603
Maybole	Maybole	Smith	1606

Place	*Parish*	*Occupation*	*Date*
Maybole	Maybole	Smith	1606
Maybole	Maybole	Tailor	1603
Maybole	Maybole	Tailor	1602
Maybole	Maybole	Tailor	1603
Barleith	Riccartoun	Smith	1604
Milne of Gilmiliscroft	Sorn	Fuller	1606
Blook	Stewarton	Fuller	1602
Blook	Stewarton	Walker	1606
Kirklandmure	?	Weaver	1608

Appendix 2: Trades noted in Register of Sasines, 1650-60			
Place	***Parish***	***Occupation***	***Date***
Newtoune	?	Cordiner	1657
Astingpoffill	?	Fuller	1660
Newtoune	?	Litster	1657
Park Mylne	?	Multurer	1656
Barshaire	?	Tailor	1659
Astingpoffill	?	Walker	1654
Astingpoffil	?	Weaver	1658
Newtoune	?	Weaver	1659
Tornbrak	?	Weaver	1652
Astingpoffil	?	Wobster	1658
Ayr	Ayr	Cooper	1658
Ayr	Ayr	Flesher	1658
Ayr	Ayr	Flesher	1655
Ayr	Ayr	Furrier	1651
Ayr	Ayr	Maltman	1655
Ayr	Ayr	Maltman	1655
Ayr	Ayr	Skinner	1656
Ayr	Ayr	Slater	1657
Ayr	Ayr	Smith	1655
Ayr	Ayr	Smith	1654
Ayr	Ayr	Smith	1655
Canongate	Ayr	Wright	1650
Kirk of Beith	Beith	Coppersmith	1656
Kirk of Beith	Beith	Coppersmith	1660
Almound	Colmonell	Smith	1655
Nether Raith	Fenwick	Tailor	1657
Priestland	Galston	Wright	1655
Irvine	Irvine	Cooper	1659
Irvine	Irvine	Cooper	1658
Irvine	Irvine	Cooper	1658
Irvine	Irvine	Tanner	1660
Irvine	Irvine	Tanner	1660
Bogwood	Irvine	Wright	1650
Kilmarnock	Kilmarnock	Bonnet Maker	1660
Kilmarnock	Kilmarnock	Skinner	1660
Kilmaurs	Kilmaurs	Cordiner	1658
Kilmaurs	Kilmaurs	Cordiner	1658
Kilmaurs	Kilmaurs	Cordiner	1660
Kilmaurs	Kilmaurs	Cordiner	1659
Kilmaurs	Kilmaurs	Cordiner	1660

Place	*Parish*	*Occupation*	*Date*
Bullahill	Kilmaurs	Cutler	1660
Kilmaurs	Kilmaurs	Cutler	1660
Kilmaurs	Kilmaurs	Cutler	1660
Kilmaurs Milne	Kilmaurs	Miller	1660
Kilmaurs	Kilmaurs	Shoemaker	1656
Kilmaurs	Kilmaurs	Shoemaker	1650
Kilmaurs	Kilmaurs	Shoemaker	1657
Kilmaurs	Kilmaurs	Shoemaker	1656
Bridgend of Kilmaurs	Kilmaurs	Weaver	1660
Byres	Kilwinning	Cordiner	1660
Byres	Kilwinning	Cordiner	1660
Byres	Kilwinning	Cordiner	1660
Easter Bridgend	Kilwinning	Cordiner	1656
Corsehill	Kilwinning	Slater	1657
Corsehill	Kilwinning	Slater	1657
Kilwinning	Kilwinning	Smith	1657
Byres	Kilwinning	Weaver	1657
Kilwinning	Kilwinning	Wright	1659
Kilwinning	Kilwinning	Wright	1659
Newmilns	Loudoun	Cooper	1657
Newmilns	Loudoun	Cordiner	1650
Newmilns	Loudoun	Cordiner	1656
Newmilns	Loudoun	Cordiner	1660
Newmilns	Loudoun	Cordiner	1660
Newmilns	Loudoun	Fuller	1660
Newmilns	Loudoun	Fuller	1652
Newmilns	Loudoun	Fuller	1651
Newmilns	Loudoun	Fuller	1656
Newmilns	Loudoun	Shoemaker	1660
Newmilns	Loudoun	Shoemaker	1657
Newmilns	Loudoun	Shoemaker	1657
Newmilns	Loudoun	Shoemaker	1657
Newmilns	Loudoun	Tailor	1659
Newmilns	Loudoun	Tailor	1654
Newmilns	Loudoun	Tailor	1659
Newmilns	Loudoun	Walker	1656
Newmilns	Loudoun	Weaver	1652
Newmilns	Loudoun	Wobster	1657
Newmilns	Loudoun	Wobster	1660
Newmilns	Loudoun	Wright	1652
Hauch	Mauchline	Smith	1655
Mauchline	Mauchline	Wright	1658

Place	*Parish*	*Occupation*	*Date*
Maybole	Maybole	Cordiner	1657
Maybole	Maybole	Falconer	1659
Maybole	Maybole	Slater	1659
Kirkland of Maybole	Maybole	Smith	1655
Maybole	Maybole	Tailor	1656
Maybole	Maybole	Tailor	1656
Maybole	Maybole	Tailor	1656
Maybole	Maybole	Tailor	1655
Maybole	Maybole	Tailor	1660
Maybole	Maybole	Tailor	1656
Maybole	Maybole	Tanner	1660
Maybole	Maybole	Tanner	1650
Maybole	Maybole	Tanner	1660
Maybole	Maybole	Wobster	1658
Maybole	Maybole	Wobster	1658
Maybole	Maybole	Wobster	1657
Maybole	Maybole	Wobster	1657
Maybole	Maybole	Wright	1657
Maybole	Maybole	Wright	1655
Muirkirk	Muirkirk	Smith	1656
Newton upon Ayr	Newton upon Ayr	Dyer	1657
Cumnock	Old Cumnock	Tailor	1656
Steinsone	Stevenston	Coalhewer	1650

Appendix 3: Trades noted in the General Register of Sasines,			
1700-1710			
Place	***Parish***	***Occupation***	***Date***
Knockarnell	Girvan	Smith	1707
Kilmarnock	Kilmarnock	Maltman	1711

Appendix 4: Trades noted in the Commissariat of Glasgow, 1750-1760			
Place	***Parish***	***Occupation***	***Date***
Gateside of Largstoun	?	Weaver	1758
Saltcoats	Ardrossan	Shoemaker	1751
Ayr	Ayr	Brickmaker	1757
Ayr	Ayr	Flesher	1750
Ayr	Ayr	Tailor	1754
Ayr	Ayr	Tailor	1752
Arnleg Mill	Colmonell	Miller	1758
Girvan	Girvan	Wright	1756
Irvine	Irvine	Flesher	1760
Irvine	Irvine	Gardener	1756
Irvine	Irvine	Mason	1751
Irvine	Irvine	Ship carpenter	1758
Irvine	Irvine	Ship carpenter	1757
Groatholm	Irvine	Wright	1758
Irvine	Irvine	Wright	1757
Irvine	Irvine	Wright	1758
Kilnburney Bridge	Kilbirnie	Miller	1755
Greenridge	Kilburney	Tailor	1755
Cockstone	Kilmarnock	Carrier	1756
Kilmarnock	Kilmarnock	Manager of Woollen Manufactory	1758
Kilmarnock	Kilmarnock	Mealman	1758
Kilmarnock	Kilmarnock	Tailor	1752
Kilmaurs	Kilmaurs	Mason	1760
Kilmaurs	Kilmaurs	Wright	1760
Eglinton	Kilwinning	Manager of Coal Works	1754
Kilwinning	Kilwinning	Smith	1756
Byres	Kilwinning	Weaver	1760
Barwheys	Mauchline	Shoemaker	1751
Newark	Maybole	Maltman	1751
Maybole	Maybole	Shoemaker	1757
Cumnock	Old Cumnock	Wright	1758
Catrine Mill	Sorn	Miller	1757
Stewarton	Stewarton	Mason	1752
Kilbride	West Kilbride	Shoemaker	1756

Appendix 5: Excavated and published MOLRS sites in Scotland since 1955

Site	NGR	Region	Year	Excavator	Published	Source
Crumhaugh Tower	NT 485 183	Borders	1963	G.A.Wood	?	DES
Dod Fort	NT 427 060	Borders	1982	I.M.Smith	?	HS
Douglas Burn	NT 285 255	Borders	1965-66	J.M.Gilbert/I.G.Brown	?	DES
Floors Castle	NT 719 344	Borders	1985	J.Clark	?	DES
Kirkconnel	NY 248 755	Borders	1968	L.Laing	Yes	DES
Lour, Stobo	NT 179 357	Borders	1959-60	J.D.Dunbar/G.D.Hay	Yes	HS
Smailcleugh	NT 764 151	Borders	1980-82	I.M.Smith/J.F.Jackson	?	HS
Springwood	NT 722 333	Borders	1967	C.Martin	?	DES
Springwood	NT 722 334	Borders	1985	R.Grove	?	DES
The Hirsel	NT 830 406	Borders	1979-	R. Cramp	?	HS
Whitrighill	NT 622 345	Borders	1992	J.S.Dent	?	DES
Lianach	NN 535 208	Central	?	J.H.Stewart/M.B.Stewart	Yes	HS
Moirlanich	NN 562 341	Central	1993	NTS	?	HS
Barhobble	NX 310 494	Dumf & Gal	1984-85	W.F.Cormack	?	DES
Chapel Farm	NT 0705	Dumf & Gal	1992	CFA	Yes	DES
Coats Hill	NT 071 044	Dumf & Gal	1991	CFA	?	DES
Craiglearan	NX 704 924	Dumf & Gal	1974	C.R.Mayer	?	DES
Dinwoodiegreen	NY 107 883	Dumf & Gal	1958	Blake/Hodgson	Yes	HS
Douglen	NY 339 891	Dumf & Gal	1985	J. Cannell	?	HS
Ellisland Farm	NX 929 838	Dumf & Gal	1993	J.A.Atkinson/I.Banks/T.Pollard	No	DES
Halfway House	NX 305 617	Dumf & Gal	1989	O.A.Owen	Yes	HS
Kirkconnel	NY 248 755	Dumf & Gal	1968	L.R.Laing	?	HS
Polmaddy	?	Dumf & Gal	1975	M.J.Yates	Yes	HS
Roucanfoot	NY 023 776	Dumf & Gal	1968	J.Williams	?	DES
Rue Farm	?	Dumf & Gal	1961	Major General Scott-Elliot	?	DES
Balfarg	NO 284 029	Fife	1985	G.J.Barclay/P.N.Tavener	Yes	DES

Easter Kinnear	NO 406 235	Fife	1989	S.T.Driscoll	forthcoming	DES
Hawkshill.	NO 410 240	Fife	1990	S.T.Driscoll/T.Watkins	forthcoming	DES
Kilmux	NO 361 050	Fife	1995	R.Will	No	DES
Scotscraig Farm	N0 453 278	Fife	1992	C. Wickham-Jones	?	HS
Scotstarvit	NO 353 108	Fife	1995	G.MacGregor	forthcoming	DES
The Gask	NO 103 927	Fife	1993	R.Will	forthcoming	DES
Green Castle	NJ 489 688	Grampian	1977	I. Ralston	?	HS
Old Rattray	NK 088 579	Grampian	?-1990	H.K.Murray/J.C.Murray	Yes	DES
Achaidh Mhoir	NC 581 032	Highland	1991	F.Newall/W.Lonie	?	DES
Dun Lagaidh	NH 142 913	Highland	1967-8	E.W.MacKie	?	HS
Grantown on Spey	NH 789 473	Highland	1995	J.A.Atkinson	Yes	DES
Kinloch Rannoch	NN 664 574	Highland	1961	M.Stewart/R.W.Feacham	?	DES
Lairg	NC 582 055	Highland	1988	R. McCullagh	forthcoming	HS
Rosal	NC 690 415	Highland	1962	J.X.W.P. Corcoran	Yes	HS
Torrin, Skye	NG 559 226	Highland	1993	M. Wildgoose	?	HS
Cramond	NT 189 769	Lothian	1988, 1990	V.E.Dean	?	DES
Torness	NT 743 748	Lothian	1975	R.Mercer	?	DES
Brettaness	HY 397 332	Orkney	1984	J.Marwick	?	DES
Kebister	HU 457 455	Shetlend	1985-	O.A. Owen	?	HS
Ardnaman	NS 163 791	Strathclyde	1970-1	CAS	?	HS
Auchategan	NS 002 843	Strathclyde	?	D.N.Marshall	Yes	HS
Barking House	NR 707 845	Strathclyde	1978	NHASMA	?	HS
Castlecary Glen	NS 783 772	Strathclyde	1959-60	R.Livens	?	HS
Craighead	NS 818 404	Strathclyde	1977-8	T.Affleck	?	HS
Crookedstane Farm	NS 969 161	Strathclyde	1991	CFA	Yes	DES
Cumbernauld House	NS 774 760	Strathclyde	1963	D.M.Hunter	?	DES
Dunloskin	NS 164 789	Strathclyde	1985	E.B.Rennie	?	HS
Glendorch	NS 870 188	Strathclyde	1985-6	T.Ward	?	HS
Glenochar	NS 946 139	Strathclyde	1983-	T.Ward	?	HS
Greenhill Farm	NS 936 338	Strathclyde	1979	E.Archer	?	HS
Knapps Homestead	NS 369 688	Strathclyde	1961-62	F.Newall	Yes	HS

Lephinchapel	NR 962 895	Strathclyde	1989	E.B.Rennie	?	HS
Little Dunagoil	NS 086 534	Strathclyde	1959-61	D.N.Marshall	Yes	HS
Loch Glashan	NR 917 925	Strathclyde	1961	H.Fairhurst/J.G.Scott	Yes	DES
MacEwans Castle	NR 916 796	Strathclyde	1968-69	D.Marshall	Yes	DES
Machrins	NR 358 934	Strathclyde	1977-78	RCAHMS	?	DES
Poltalloch	NR 821 972	Strathclyde	1961-62	E.R.Creegan/S.Creegan	?	DES
Snar	NS 862 200	Strathclyde	1986	T.Ward	?	HS
Windgate House	NT 016 271	Strathclyde	1984	T.Ward	?	DES
Wintercleugh	NS 980 114	Strathclyde	1991	T.Ward	?	HS
Allean Forest	NN 859 603	Tayside	1972, 1974, 1976	M. Stewart	?	HS
Allt na Moine Buidhe	NN 708 615	Tayside	1969-70	M. Stewart	?	HS
Ben Lawers Nature Trail	NN 61 39	Tayside	1996	J.A.Atkinson	forthcoming	DES
Chapelton	NO 625 477	Tayside	1983-4	D.Pollock	Yes	HS
Lix	NN 555 302	Tayside	1959-61	H.Fairhurst	Yes	HS
Miltown of Lawers	NN 68 39	Tayside	1996	J.A.Atkinson	forthcoming	DES
North Cragganester	NN 654 382	Tayside	1996	J.A.Atkinson	forthcoming	DES
North Pitcarmick	NO 061 581	Tayside	1994-6	J.Barratt/J.Downes	forthcoming	HS
Turrenich Farm	NN 857 397	Tayside	1969	A.Morrison	?	HS
Allt Chrisal	NL 642 977	Western Isles	1989	P. Foster	?	HS
Kirkidale	NF 800 265	Western Isles	1993	J.Moreland	?	DES
St.Kilda	NF 099 993	Western Isles	1986-	N.Emery	Yes	HS
Udal	NF 824 784	Western Isles	1963-	I.A.Crawford	No	DES

Appendix 6: MOLRS sites in North and South Carrick

Site Name	NGR	RCAHMS No	Structures	Kiln/ Kilnbarns	Enclosures	Pont	Roy	Arm	Craw	Thom	OS1	Area
Airyewn	NX 224 755	163	2	K		Y				Y	R	S
Ardachie	NS 359 029	190	1 + 1		1					Y	R	N
Auchengairn	NX 331 971	181	1		2							N
Auchenmady	NX 225 932	182	1 + ?	K + ?	2	Y	Y	Y		Y	R	N
Auchensoul	NX 267 938	183	1		1						R	N
Auchensoul Hill 1	NX 259 951	184	6 huts									N
Auchensoul Hill 2	NX 263 951	185	2 huts + mound									N
Baing	NS 401 023	186	?			Y	Y			Y	R	N
Balgaverie 1	NX 236 964	187	1 + ?								R	N
Balgaverie 2	NX 239 962	188	1		1						R	N
Balig	NX 092 840	164	1		1							S
Baligmorrie	NX 222 907	189	1		1						R	N
Balnowlart 1	NX 095 832	166	3+		1							S
Balnowlart 2	NX 096 873	167	1		1							S
Balnowlart Hill	NX 101 835	168	1 +		1	Y						S
Balsalloch Hiil	NX 123 886	169	3							Y	R?	S
Barjarg	NX 319 782	170	1		1							S
Barnvannoch 1	NX 140 740	171	1		1							S
Barnvannoch 2	NX 141 748	172	1									S
Barwinnock	NX 306 772	173	3 +									S

Barwinnock Hill	NX 311 770	174	3		1						R	S
Blanefield	NS 255 071	191	1								R	N
Braker	NX 303 974	192	1		3						R	N
Brochloch Castle	NS 297 115	193	4								R	N
Byne	NX 182 827	191	1	K	1 +		Y	Y		Y	R	S
Byne Hill 1	NX 179 947	194	1		1						R	N
Byne Hill 2	NX 177 947	195	3 huts								R	N
Cairnannock	NX 370 966	196	?		1						R	N
Cawan	NX 246 871	177	3		1							S
Cawin	NS 363 031	208	1		1						R	N
Chapel Croft	NX 260 808	178	3	KB	1							S
Chirmorie 1	NX 220 760	179	1		1							S
Chirmorie 2	NX 205 770	180	2									S
Clauchriekaig	NX 321 853	182	3							Y	R	S
Clauchrierob	NX 312 847	181	2	K							R	S
Cloyall/Slacks	NS 423 010	197	3		1	Y	Y	Y		Y	R	N
Craig Hill	NX 170 874	183	1		1							S
Craigcar	NX 138 873	204	2 +		1					Y	R	S
Craigneil Hill	NX 141 843	184	2		1						R	S
Crongart	NX 269 822	185	3		1 + 2					Y	Y	S
Currarie	NX 165 914	198	1 hut								R	N
Daljedburgh	NX 307 963	199	2								R	N
Daljedburgh Hill 1	NX 317 966	200	5 + 2 huts								R	N
Daljedburgh Hill 2	NX 324 971	201	3 + 5 huts								R	N
Dalnean Hill	NS 463 055	202	3	KB	1	Y?					R	N

Darnarroch	NX 241 755	186	1 + 1		1 + 1	Y	Y	Y		Y	R	S
Davy's Hill	NX 068 747	187	2			Y	Y	Y				S
Dawan	NX 262 838	176	1					Y		Y	R	S
Delamford	NX 285 986	203	5 + 4 +2 huts								R	N
Dobbingstone	NS 308 002	204	3?								R	N
Donald's Isle	NX 494 965	205	2								R	N
Dornal	NX 296 775	188	1									S
Dounie	NX 204 894	165	1	?	3						R	S
Duniewick	NX 114 851	189	1									S
Dupin	NX 234 939	207	2		1?						R	N
Dyke 2	NS 365 032	209	1hut								R	N
Dyke 3	NS 368 037	210	3 + 1? huts								R	N
Faikham Rig 1	NX 265 980	211	10 + 1 + 1 huts								R	N
Faikham Rig 2	NX 263 982	212	2 huts								R	N
Fell Hill	NX 189 907	213	2 + 1 huts								R	N
Fore Burn	NS 425 001	215	2 huts								R	N
Gass 1	NS 403 058	216	1		1				Y	Y	R	N
Gass 2	NS 412 058	217	2		2						R	N
Gass 3	NS 415 052	218	1 + 2 (huts)								R	N
Gass4	NS 421 055	219	+ 1(h)		1						R	N
Glenauchie Burn	NS 423 019	220	1 + 1 huts?								R	N
Glengennet 1	NX 277 950	221	2	K		Y	Y	Y		Y	Y	N
Glengennet 2	NX 280 952	222	1								R	N
Glenmount	NS 452 022	223	1 + outbuilding	KB		Y		Y		Y	R	N
Glenour	NX 179 827	192	1									S

Glensalloch Wood	NS 286 044	224	1		1	Y		Y		Y	R	N
Glenthraig	NS 426 004	214	2	KB	1	Y	Y	Y		Y	R	N
Glessel	NS 470 021	225	2		1						R	N
Half Merk	NX 275 853	193	2	K		Y	Y	Y		Y	R	S
High Altercannoch 1	NX 248 811	194	1									S
High Altercannoch 2	NX 244 807	195	1 + 1		1							S
High Altercannoch 3	NX 245 805	196	1									S
High Lagganmonie	NX 277 903	206	1		2						R	N
K ilmore	NS 387 127	227	?								R	N
Kilbride	NS 398 051	234	3	KB							R	N
Kilbryd	NX 243 876	197	3		1	Y	Y				R	S
Kilgrossan	NX 195 781	198	1	K		Y		Y		Y		S
Kirkland	NX 249 929	228	2	K						Y	R	N
Knockonyr	NS 370 005	229	2		1	Y					R	N
Knockskae 1	NS 371 011	230	huts								R	N
Knockskae 2	NS 370 012	231	huts								R	N
Laganbeastie Burn	NX 124 737	199	2		1							S
Laggan Loch	NX 206 955	232	3 huts								R	N
Lagganmonie Burn	NX 274 913	233	3 huts?								R	N
Laigh Dangart	NX 174 860	200	4									S
Laigh Lagganmonie	NX 270 915	265	1		1 + 2 ?						R	N
Little Shalloch	NS 450 027	235	1			Y					R	N
Loch Dornal	NX 294 762	201	?									S
Loch Goosey	NX 298 822	202	?									S
Loch Hill	NX 183 811	203	9									S

Loch Lochton	NX 170 923	236	1	K?							R	N
Lochlufe	NS 425 032	237	? (sheepfold)			Y		Y		Y	R	N
Lochton Hill	NX 155 927	238	2		3						R	N
MacEwanston	NX 139 827	175	3		1						R	S
Macherquat	NX 107 843	205	4	K	2						R	S
Macnabstone	NS 475 008	239	2 + 1	K	1	Y		Y		Y	R	N
Mark	NX 252 878	206	1		1						R	S
Mark, Glen App	NX 077 743	208	1		1							S
Meikle Bennane	NX 100 864	209		K	2							S
Meikle Shalloch	NS 429 027	240	1								Y	N
Millenderdale 1	NX 187 912	241	1		1						R	N
Millenderdale 2	NX 177 903	242	2 huts								R	N
Millenderdale 3	NX 165 902	243	2		?						R	N
Millenderdale 4	NX 167 902	244	1	K							R	N
Milton	NX 293 959	245	1		1						R	N
Mirren's Stone	NX 096 735	210	2									S
Moak Hill	NX 141 874	211	1		1							S
Munteoch	NS 438 036	246	1		1	Y		Y		Y	Y	N
Near Eyes Stank	NX 252 844	212	2 ?									S
Nether Grimmet	NS 442 075	226	1 + 1		2	Y		Y		Y	R	N
Old Mark	NX 078 743	207	3	K	1		Y?	Y?		Y?	R	S
Old Park of Gleick	NX 058 718	213	3 + 1	K	1 + 2	Y		Y			N	S
Pheelie	NX 275 982	247	1	K	1						R	N
Pinbain Bridge	NX139 914	248	1		1						R	N
Pinbraid	NX 144 877	190	5	K	1	Y		Y		Y	R	S

Pinerrach Burn	NX 270 951	249	1								R	N
Pinmacher	NX 200 938	250	2 huts								R	N
Pinmullan	NX 327 953	258	1		1						Y	N
Pinwherry Hill	NX 186 854	214								Y	R	S
Pinwhiskie	NX 105 725	215	3 + 1									S
Quarrel Hill	NS 259 031	251	3	KB	3	Y	Y	Y			R	N
Red Burn Bridge 1	NS 431 059	252	7 huts								R	N
Red Burn Bridge 2	NS 434 062	253	1 huts								R	N
Red Burn Bridge 3	NS 432 068	254	3 huts								R	N
Sally Pollocks Bridge	NX 329 966	255	1		1						R	N
Saugh Hill	NX 213 970	256	2 + 1								R	N
Shalloch Burn	NS 445 034	257	1		1						R	N
Strabracken	NX 142 758	216	1		1						R	S
Tairlaw Toll	NX 395 995	259	2 huts								R	N
Tarfessock	NX 364 885	260	3 + 1		3	Y		Y		Y	R	N
The Lanes	NX 265 965	261	3		?						R	N
Troweir Hill 1	NX 215 959	262	3 + 11 (huts)								R	N
Troweir Hill 2	NX 212 963	263	1 hut								R	N
Wee Hill of Glenmount	NS 459 017	264	2		1 + 1						R	N
West Altercannoch	NX 235 815	217	3		2							S
White Knowes	NX 276 925	267	4 huts								R	N

Appendix 7: Lime working sites in Ayrshire, 1855-57

Name	*Type*	*Parish*	*NGR*
Ardrossan	LK	Ardrossan	NS 223 443
Diddup	LK	Ardrossan	NS 265 445
Girthill	LK/LQ	Ardrossan	NS 269 467
Girthill II	OLQ	Ardrossan	NS 276 468
Knockrivock	LK	Ardrossan	NS 255 442
Mayfield	LK	Ardrossan	NS 258 425
Mayfield II	OLQ	Ardrossan	NS 262 425
Meikle Itlington	LK/LQ	Ardrossan	NS 253 473
Millfarm	LK	Ardrossan	NS 235 446
Montefode Braes	LK	Ardrossan	NS 222 444
Muirlaught	LK	Ardrossan	NS 260 458
New England	OLQ	Ardrossan	NS 252 428
North Saltpans	LK	Ardrossan	NS 240 410
Quarry House	LK/LQ	Ardrossan	NS 263 478
Sorbie	LK	Ardrossan	NS 244 444
Stanley	LK	Ardrossan	NS 235 446
Stanleyburn	LK	Ardrossan	NS 240 421
Whitelees Farm	LK	Ardrossan	NS 224 443
Woodhead	OLK	Ardrossan	NS 76 417
Yonderhouses	LK	Ardrossan	NS 271 473
Gass Water	LW	Auchinleck	NS 630 220
Glenmuir	LW/OLK/LQ	Auchinleck	NS 630 208
Laigh Glenmuir	OLQ	Auchinleck	NS 621 205
Penbreck	LW/OLQ	Auchinleck	NS 726 198
Springhill	OLQ	Auchinleck	NS 641 201
Knocksoul	OLK	Ayr	NS 389 196
Pleasantfield	LK	Ayr	NS 352 164
Wee Macnairston	OLK	Ayr	NS 386 190
Auchlewan	OLK	Barr	NX 228 917
Benan Hill	OLQ	Barr	NX 239 926
Craigwells	LQ	Barr	NX 256 950
Dularg	LQ	Barr	NX 262 926
Dularg Hill	LQ	Barr	NX 265 924

Kirkdominœ Hill	LQ	Barr	NX 248 929
Boaston	LQ	Beith	NS 357 517
Boreston	OLQ	Beith	NS 373 506
Broadstone	LK/LW/LQ	Beith	NS 362 531
Broadstone Hall	OLK/OLQ	Beith	NS 354 528
Brockenhills	OLQ	Beith	NS 341 522
Bungleburn Bridge	OLK/LQ	Beith	NS 380 498
Burnhouse Bridge	OLK/OLQ	Beith	NS 383 508
Crawfield	OLK/OLQ	Beith	NS 332 527
Dochra	LK/LQ	Beith	NS 363 524
Foreside	OLK/OLQ	Beith	NS 376 503
Greenhills	OLK/OLQ	Beith	NS 374 511
Haghead	OLQ	Beith	NS 371 504
Haghead II	OLQ	Beith	NS 371 505
Hillhead	LQ/OLQ	Beith	NS 368 528
Langside	LW/LK/OLK	Beith	NS 369 536
Low Middleton	OLK/OLQ	Beith	NS 402 526
Lugtonridge	OLK/LQ	Beith	NS 367 492
Lugtonridge II	OLK	Beith	NS 367 487
Lyonshields	LK/OLQ	Beith	NS 373 538
Middleton	OLQ	Beith	NS 393 524
Nettlehurst	LK/LQ	Beith	NS 362 504
Nettlehurst II	LK/OLQ	Beith	NS 368 504
North Bar	LQ	Beith	NS 364 515
North Biggart	OLK/OLQ	Beith	NS 404 536
Overhessilhead	OLK/OLQ	Beith	NS 383 535
Roughwood	OLK/LK/LQ	Beith	NS 347 522
South Biggart	OLK/OLQ	Beith	NS 408 531
Thirdpart	LK/LQ/OLQ	Beith	NS 374 512
West Broadstone	LQ	Beith	NS 361 527
West Overton	OLK/OLQ	Beith	NS 375 534
Wester Highgate	LQ	Beith	NS 392 521
Aldons	LW/LK	Colmonell	NX 197 897
Bargain Hill	LK/LQ	Colmonell	NX 189 877
Big Bennane	OLK	Colmonell	NX 097 868
Craigneil	LQ	Colmonell	NX 147 853
Ligget Cheek	LK/OLQ	Colmonell	NX 114 855

Macherwhat	OLK	Colmonell	NX 109 842
Millenderdale	OLK/OLQ	Colmonell	NX 170 906
Kerspark	LK/OLQ	Coylton	NS 422 148
Dykehead	OLK	Craigie	NS 461 326
Harelaw	OLK/OLQ	Craigie	NS 420 330
Craighead	LW/LK	Dailly	NS 234 013
Craighead Hill	OLQ	Dailly	NS 229 015
Lannielane	LW/LK	Dailly	NS 314 017
Sunnyside	OLK	Dailly	NS 278 032
Polnessan Burn	OLP	Dalmellington	NS 431 114
Aitruach Craig	LK/OLQ	Dalry	NS 278 508
Auchenskeith	OLK	Dalry	NS 307 465
Auchenskeith Quarry	LK/LQ/OLQ	Dalry	NS 314 468
Auldmuir	LK	Dalry	NS 265 500
Auldmuir	LW/LQ	Dalry	NS 265 504
Baidland Mains	LQ	Dalry	NS 269 503
Bank Quarry	LQ	Dalry	NS 314 473
Barkip Railway	OLQ	Dalry	NS 338 500
Birkhead	LK	Dalry	NS 256 500
Birkhead II	LK/OLQ	Dalry	NS 258 495
Birkheadsteel	LK	Dalry	NS 248 505
Blackstone	LK/LQ	Dalry	NS 257 492
Blairock Hill	LK/LQ/OLQ	Dalry	NS 287 532
Bowertrapping	LK/LQ	Dalry	NS 326 498
Brodocles	OLQ	Dalry	NS 318 487
Burntongues	LK	Dalry	NS 279 503
Carwinning Hill	LK	Dalry	NS 284 525
Cockenzie Cottage	LQ	Dalry	NS 310 461
Cockenzie Cottage II	LK	Dalry	NS 306 456
Cubeside	LK/LQ	Dalry	NS 268 509
Cunningham Baidland	OLQ	Dalry	NS 276 511
Cunningham Baidland II	LQ	Dalry	NS 278 511
Dykehead T.P.	LK/LQ	Dalry	NS 255 481
Fleshwood	LK/LQ	Dalry	NS 275 500
Giffertland Mains	LK	Dalry	NS 266 489
Glencart	OLQ	Dalry	NS 319 493
Greenhirst	LK	Dalry	NS 280 494

High Linn	LK	Dalry	NS 284 489
Highfield	LK/LQ	Dalry	NS 310 499
Hindog	LK	Dalry	NS 282 511
Holmbyre	LK	Dalry	NS 268 484
Kilnhouse	OLW/LK/LQ	Dalry	NS 284 540
Knollhead	LK	Dalry	NS 334 491
Langbar	OLK	Dalry	NS 328 527
Langside	OLK	Dalry	NS 295 524
Linn Quarry	LQ	Dalry	NS 284 486
Linncraigs	LK	Dalry	NS 281 485
Little Auldmuir	OLQ	Dalry	NS 265 503
Little Barkip	OLQ	Dalry	NS 335 505
Loans Quarry	OLK/LQ	Dalry	NS 311 486
Meikle Broadlie	LK	Dalry	NS 278 499
Meiklemire	LK/OLQ	Dalry	NS 283 514
Newhouse	LK	Dalry	NS 301 469
Newside	LK/OLQ	Dalry	NS 288 519
North Kirkland	LK	Dalry	NS 286 498
North Lissens	OLK/OLQ	Dalry	NS 326 478
South Howrat	LW	Dalry	NS 289 536
South Jameston	OLK	Dalry	NS 318 463
South Lissens	OLK	Dalry	NS 326 476
Stoopshill	OLK	Dalry	NS 302 489
Sycamore Hill	OLQ	Dalry	NS 330 483
Thirdpartpark	LK	Dalry	NS 264 508
Thirdpartpark II	LK/LQ	Dalry	NS 264 506
West Bankhead	OLQ	Dalry	NS 338 500
Wheatyfauld	OLK	Dalry	NS 323 505
Whitecraig	LK	Dalry	NS 279 511
Boreland Glen	OLK	Dalrymple	NS 401 135
Milreoch	LK	Dalrymple	NS 402 147
Drummaur	LK	Dreghorn	NS 362 396
Little Alton	LK	Dreghorn	NS 390 420
Quarry House	OLQ	Dreghorn	NS 431 436
Warwickmains	LK	Dreghorn	NS 373 399
Wheatrig	LK	Dreghorn	NS 399 424
Broadhirst	LK	Dundonald	NS 371 329

Broomhill	LK	Dundonald	NS 378 338
Clevance	LK	Dundonald	NS 362 322
Collenan	LK	Dundonald	NS 347 326
Darley Burn	LK	Dundonald	NS 337 315
Drybridge	LK	Dundonald	NS 360 365
Gateside	OLK	Dundonald	NS 335 336
Hallyards	LK	Dundonald	NS 360 333
Harperland	LK	Dundonald	NS 372 357
Lave Mill	LK	Dundonald	NS 376 368
Pans	OLK	Dundonald	NS 324 315
Blackhouse	LK	Dunlop	NS 417 418
Bourrock	OLK	Dunlop	NS 407 514
Bourrock II	OLK/LQ	Dunlop	NS 408 514
Brockwellmuir	OLK	Dunlop	NS 416 511
Gameshill Quarry	LK/LQ	Dunlop	NS 409 480
Hallmoss	OLQ	Dunlop	NS 424 513
Lugton Bridge	OLK/OLQ	Dunlop	NS 414 526
New Mill	LK	Dunlop	NS 437 505
West Langton	LK	Dunlop	NS 402 507
West Waterland	OLK/LQ	Dunlop	NS 405 523
Bruntland Limeworks	LW	Fenwick	NS 480 431
High Clunch	LK	Fenwick	NS 465 471
High Rusha II	LK/OLQ	Fenwick	NS 508 420
Laigh Clunch	OLQ	Fenwick	NS 460 474
Laigh Todhill	LQ	Fenwick	NS 440 432
Low Gainsford	LK/OLK	Fenwick	NS 442 441
Muirend	LK	Fenwick	NS 452 426
Pokelly Hall	LK	Fenwick	NS 455 452
Sandbed	OLQ	Fenwick	NS 464 414
Townhead of Gree	LK	Fenwick	NS 466 467
West Tannacreich	LK	Fenwick	NS 441 425
Bruntwood Mains	LK/OLQ	Galston	NS 510 324
Cessnock Castle	OLQ	Galston	NS 513 355
Craighead	OLK/OLQ	Galston	NS 491 317
Girvan	LK/LQ	Girvan	NX 183 984
Kilpatrick	LK/LQ	Girvan	NX 212 912
Little Letterpin	LK/LQ	Girvan	NX 198 927

Tormitchell	LK/LQ	Girvan	NX 234 944
East Broomlands	LK	Irvine	NS 346 384
Irvine	LW	Irvine	NS 310 381
Knowehead	LK	Irvine	NS 358 434
Littlestone	LK	Irvine	NS 340 408
Towerlands	LK	Irvine	NS 348 390
Balgry	OLK/OLQ	Kilbirnie	NS 293 540
Barrhill	LK	Kilbirnie	NS 326 557
Bashaw	LK/LQ	Kilbirnie	NS 304 561
Boag	LK	Kilbirnie	NS 302 530
Coldgreen	OLK/LQ	Kilbirnie	NS 286 562
Connelston	LK/LQ	Kilbirnie	NS 293 544
Gateside	LK	Kilbirnie	NS 317 563
Geirston	LQ/OLQ	Kilbirnie	NS 300 550
Holms	LK	Kilbirnie	NS 377 532
Kilbirnie Place	OLK	Kilbirnie	NS 302 544
Nether Mill	LK	Kilbirnie	NS 318 536
Paduff Burn	LK/LQ	Kilbirnie	NS 292 558
Paduff Burn II	LQ	Kilbirnie	NS 293 557
Stonyholm	LK	Kilbirnie	NS 320 548
Stonyholm II	OLK	Kilbirnie	NS 320 546
West Lochridge	LK	Kilbirnie	NS 327 552
Castlehill	OLK	Kilmarnock	NS 484 389
Castlehill	OLK	Kilmarnock	NS 484 389
High Rushaw I	LK/OLQ	Kilmarnock	NS 505 417
Inglewood	LK/OLQ	Kilmarnock	NS 487 412
Kilnrow	LK	Kilmarnock	NS 398 365
Moscow	LK/OLQ	Kilmarnock	NS 487 402
Mount Tabor	LK	Kilmarnock	NS 455 404
Annandale	LK	Kilmaurs	NS 399 382
Greenhill	LK	Kilmaurs	NS 399 390
Holmes	LK	Kilmaurs	NS 387 381
Muirhouse	LK	Kilmaurs	NS 388 372
Old Busbie	LK	Kilmaurs	NS 391 389
South Woodhill	OLK	Kilmaurs	NS 411 396
West Gatehead	LK	Kilmaurs	NS 386 367
Auchenhirst	OLQ	Kilwinning	NS 284 448

Auchenhirst II	LK	Kilwinning	NS 286 447
Auchenmade	OLK/OLQ	Kilwinning	NS 349 481
Auchenmade II	OLK	Kilwinning	NS 348 477
Auchenmade Quarry	LK/LQ	Kilwinning	NS 338 485
Auchenwinsey	OLK	Kilwinning	NS 338 421
Bannoch Cottage	LK/OLQ	Kilwinning	NS 313 443
Bentfauld	LK	Kilwinning	NS 367 475
Bentfauld II	LK/OLQ	Kilwinning	NS 371 472
Bricknow	OLK	Kilwinning	NS 296 447
Broanhill	LK	Kilwinning	NS 282 466
Bullerholes	OLK/LQ/OLQ	Kilwinning	NS 348 456
Byres Townhead	OLK	Kilwinning	NS 294 435
Castleburn	LK	Kilwinning	NS 293 452
Castleburn II	LK/OLQ	Kilwinning	NS 294 451
Castleburn III	OLQ	Kilwinning	NS 292 450
Clonbeith	OLQ	Kilwinning	NS 336 454
Cowinn	LK/OLQ	Kilwinning	NS 341 454
Croftfoot	OLK	Kilwinning	NS 350 440
Darmule	LK/OLK/LQ	Kilwinning	NS 334 465
Diddup	OLQ	Kilwinning	NS 266 446
Dykeneuk	OLQ	Kilwinning	NS 343 466
Dykeneuk II	LK	Kilwinning	NS 345 462
Fergushillhall	LK	Kilwinning	NS 349 462
Gateside	OLQ	Kilwinning	NS 284 452
Gateside II	LK	Kilwinning	NS 290 451
Goldcraig	LK/OS	Kilwinning	NS 319 447
Goldcraig Quarry	OLK/LQ	Kilwinning	NS 321 449
Goldcraig T.P.	OLK	Kilwinning	NS 315 446
High Gooseloan	LQ	Kilwinning	NS 321 461
High Monkcastle	OLK	Kilwinning	NS 288 477
High Monkredding	LQ	Kilwinning	NS 327 462
High Smithstone	OLK	Kilwinning	NS 280 455
Laigh Muir	OLK	Kilwinning	NS 341 459
Law Hill	LK/LQ	Kilwinning	NS 341 486
Little Sevenacres	OLK	Kilwinning	NS 329 446
Low Monkcastle	OLQ	Kilwinning	NS 296 473

Lylestone Cottage	LK/LQ/OLQ	Kilwinning	NS 330 455
Lylestone Row	LQ/OLQ	Kilwinning	NS 325 453
Megswell	LK/LQ	Kilwinning	NS 357 462
Mid Moncur	LK	Kilwinning	NS 322 435
North Auchenmade	LK/LQ	Kilwinning	NS 344 485
North Fergushill	LK	Kilwinning	NS 330 433
Outer Ardoch	OLK	Kilwinning	NS 306 448
Outer Muir of Auchenmade	LK/OLQ	Kilwinning	NS 353 485
Outer Smithstone	OLQ	Kilwinning	NS 276 460
Smithstone Dunlop	LK	Kilwinning	NS 287 460
Todholes	OLQ	Kilwinning	NS 359 480
Todholes II	LK	Kilwinning	NS 361 478
Willowridden	OLK	Kilwinning	NS 311 457
Woodend	LK	Kilwinning	NS 298 450
Auchalton	LW/LK/OLQ	Kirkmichael	NS 336 136
Balgreggan	LK/OLQ	Kirkmichael	NS 347 050
Balgreggan	LW	Kirkmichael	NS 348 052
Muirsmill Glen	OLK	Kirkmichael	NS 369 087
Rodgerston Burn	OLK/OLQ	Kirkmichael	NS 376 097
Three Thorns	OLQ	Kirkmichael	NS 356 043
Todglen	LW/LK/OLQ	Kirkmichael	NS 334 048
Black Glen	OLQ	Kirkoswald	NS 301 052
Morriston	LK	Kirkoswald	NS 228 087
Barr	LQ	Largs	NS 208 655
South Camphill	OLK	Largs	NS 274 544
Stony Port	LK	Largs	NS 177 511
Alton	OLK	Loudoun	NS 500 387
Byres	OLL/LK	Loudoun	NS 503 380
Castlehill	LK/LQ	Loudoun	NS 499 400
East Newton	OLK/OLQ	Loudoun	NS 518 386
Mosside	LQ	Loudoun	NS 614 392
Newton Law	LK/LQ/OLQ	Loudoun	NS 511 395
Whatriggs	LK	Loudoun	NS 511 396
Auchmillan Quarry	OLK/LQ	Mauchline	NS 513 297
Friendlesshead	LK	Mauchline	NS 501 302
High Holehouse	LK/OLQ	Mauchline	NS 508 314
Killoch	OLK/OLQ	Mauchline	NS 505 315

Lawers Bridge	LK	Mauchline	NS 490 311
Balig	OLK	Maybole	NS 306 178
Burnside	LK	Maybole	NS 322 179
High Smithston	LK	Maybole	NS 322 121
Airdsgreen	LQ	Muirkirk	NS 737 284
Auldhouseburn	LQ	Muirkirk	NS 709 261
Bankhead Pit	LK/LQ	Muirkirk	NS 702 262
Garpel Water	OLK	Muirkirk	NS 690 256
Hareshaw Burn	OLQ	Muirkirk	NS 757 297
Lightshaw	OLK	Muirkirk	NS 711 283
Linburn	LQ	Muirkirk	NS 696 299
Middlefield Quarries	LK/LQ	Muirkirk	NS 679 297
Middlefield Rig	LQ	Muirkirk	NS 694 300
Newhouse	LK/LQ	Muirkirk	NS 717 277
Ponesk Bridge	OLK	Muirkirk	NS 728 284
Stottencleuch	OLK/OLQ	Muirkirk	NS 742 301
West Glenbuck	LK/LQ	Muirkirk	NS 749 290
Benston II	OLK/LQ	New Cumnock	NS 584 152
Craigdullyeart	LW/LK	New Cumnock	NS 664 154
Craighouse	OLQ	New Cumnock	NS 548 104
Guett	LW	New Cumnock	NS 665 156
High Park	LK/OLK/OLQ	New Cumnock	NS 624 120
High Polqheys	OLK/OLQ	New Cumnock	NS 621 164
High Polquhirter	LK/OLQ	New Cumnock	NS 633 125
Mounthope	LK/OLQ	New Cumnock	NS 639 149
Benston	LW/LK/LL	Old Cumnock	NS 581 158
Nether Guelt	OLK/OLQ	Old Cumnock	NS 640 193
Blacksyke	LK	Riccarton	NS 415 352
Dallarshaw	OLQ	Riccarton	NS 457 333
Greenhill	OLK/OLQ	Riccarton	NS 415 334
Howcommon	LW	Riccarton	NS 428 329
Inchgatrick	OLK/OLQ	Riccarton	NS 413 337
Snodston	OLQ	Riccarton	NS 460 330
Trees	OLK	Riccarton	NS 448 333
Auchencloigh Quarry	LK/OLQ	Sorn	NS 537 322
Auchmannoch	LK/LQ	Sorn	NS 545 309

Barboigh	LK	Sorn	NS 529 303
Barrhill	LK/OLP	Sorn	NS 565 258
Blairmulloch	LW/LK	Sorn	NS 561 281
Carleith Quarry	LK/LQ	Sorn	NS 540 330
Castle Hill	OM/LQ	Sorn	NS 588 263
Coplar	LK/LQ	Sorn	NS 547 311
Crofthead	OLK/OLQ	Sorn	NS 546 312
Grange	LK/OLQ	Sorn	NS 571 309
Haggi Bank	LK	Sorn	NS 566 264
Holhouse Mill	LK/OLQ	Sorn	NS 573 262
Little Carleith	LK/LQ	Sorn	NS 538 326
Mare Burn	LK/OLQ	Sorn	NS 541 319
Newhouse	OLQ	Sorn	NS 537 321
Peel Craigs	LQ	Sorn	NS 593 258
Pottery Row	OLK	Sorn	NS 559 261
Todhills	OLQ	Sorn	NS 544 317
Gibsyard	OLK	St Quivox	NS 376 231
Taiglum	OLK	Stair	NS 445 184
Hullerhirst Quarry	LQ	Stevenston	NS 276 430
Rockvale	LK	Stevenston	NS 254 414
Auchenharvie T. P.	LK	Stewarton	NS 366 443
Barnahill	LK	Stewarton	NS 378 427
Bonshaw	LK	Stewarton	NS 376 441
Clerkland	LK/LQ	Stewarton	NS 418 474
Crossgates	OLK	Stewarton	NS 374 447
Dernshaw	LK/OLQ	Stewarton	NS 365 452
Eastburn	LK/LQ	Stewarton	NS 429 471
Fairliecrevoch	LK	Stewarton	NS 369 424
Gabrochhill	LK/LQ	Stewarton	NS 456 515
Gabrochhill	OLQ	Stewarton	NS 450 509
Gallowberry	LK	Stewarton	NS 423 487
Gillmill	LK	Stewarton	NS 395 456
Haysmuir	LK	Stewarton	NS 380 436
High Chapelton	LK	Stewarton	NS 396 444
Kirkwood	OLK/OLQ	Stewarton	NS 387 474
Kirkwood II	LK	Stewarton	NS 391 471
Lintbrae	LK/LQ	Stewarton	NS 459 472

Little Cutstraw	OLK/OLQ	Stewarton	NS 427 452
Lochridge Quarry	LK/LQ	Stewarton	NS 423 442
Lugton	LK	Stewarton	NS 377 470
Mavisbank	LK/OLQ	Stewarton	NS 352 456
Meikle Cutstraw	LK/OLQ	Stewarton	NS 429 454
Mid Hairshaw	OLK	Stewarton	NS 455 482
Mosshouse	LK	Stewarton	NS 374 456
Mossside Quarry	LK/LQ	Stewarton	NS 361 455
Pavillion Quarry	LK/LQ	Stewarton	NS 413 475
Sandylands	LK	Stewarton	NS 385 443
South Kilbride	LK	Stewarton	NS 394 463
Stocklawhill	LK/LQ	Stewarton	NS 371 439
Upper Hairshaw	OLK	Stewarton	NS 459 482
Wardlaw	LK	Stewarton	NS 368 466
Windy Yet	LK	Stewarton	NS 477 509
Burnfoot	LK/LQ	Straiton	NS 407 100
Cairnshalloch	OLW	Straiton	NS 410 102
Craigencallie	OLK	Straiton	NS 390014
Keirs	LW/OLK	Straiton	NS 432 079
Knockoner	OLQ	Straiton	NS 341 001
Little Cairnshalloch	LM	Straiton	NS 411 104
Three Thorns II	LK/OLQ	Straiton	NS 358 045
Burnbrae	OLK	Symington	NS 373 325
Spittalhill	OLK	Symington	NS 405 330
Bennals	OLK	Tarbolton	NS 405 264
Roadend	OLK	Tarbolton	NS 412 248
Chapelton	OLK	West Kilbride	NS 204 464
Kirkland	OLK	West Kilbride	NS 221 461